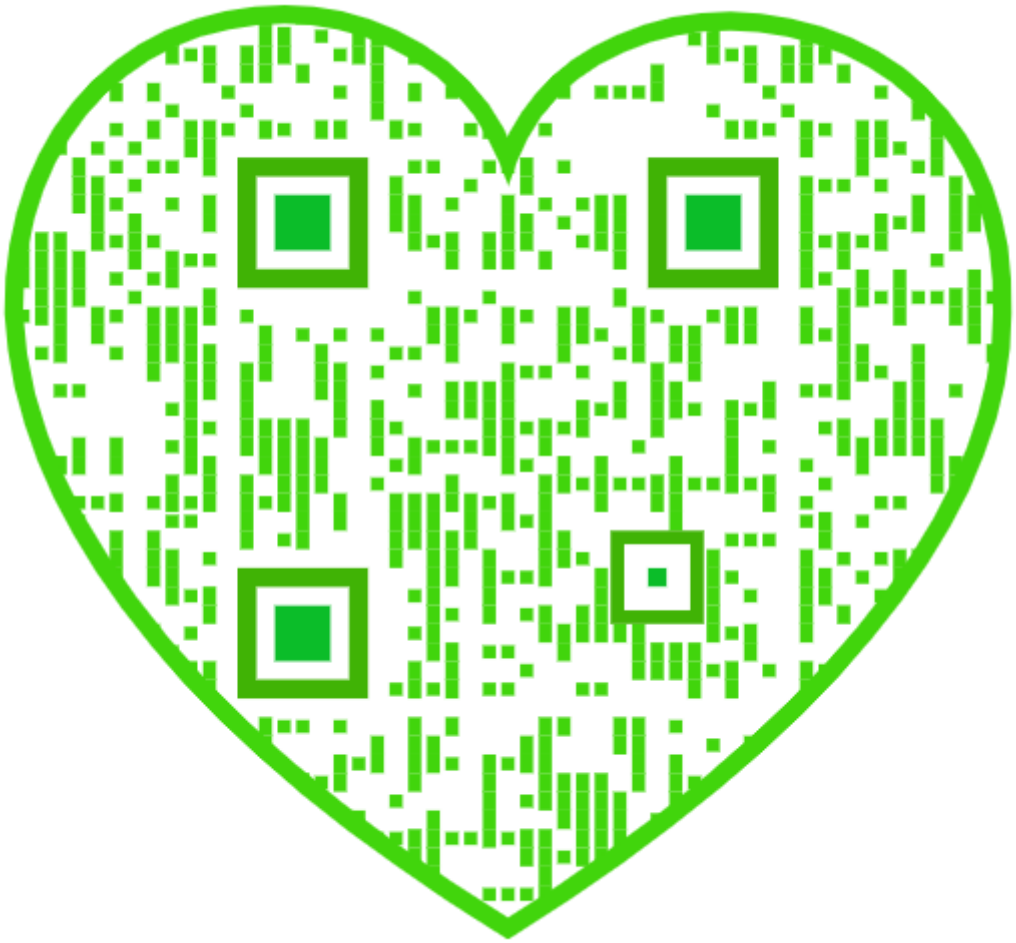

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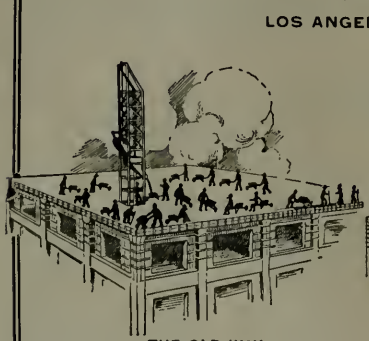

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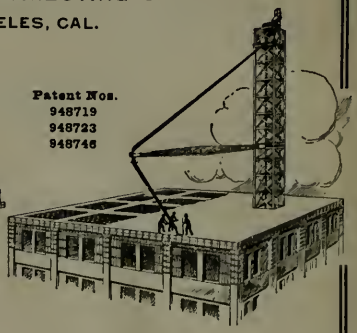

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24 California St., S. F.
Hercules Waterproofing, manufactured by Hercules Waterproofing Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT EXTERIOR FINISH
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing agents on page 153.]
Concrewaltum Paint, manufactured by Goheen Company, Canton, O. Coast branches, San Francisco, Portland and Seattle.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Buswell's Steel and Concrete Painta
Oakland, Cal.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing Agents on page 153.]
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.

CEMENT GUN
Pacific Coast Gun Co..766 Folsom St. S. F.

CEMENT TESTS AND CHEMICAL ENGINEERS
Smith, Emery & Co....651 Howard St., S. F.
Robert W. Hunt & Co.,
418 Montgomery St., S. F.

CHURCH INTERIORS
Fink & Schindler.....218 13th St., S. F

COAL CHUTES
Majestic Furnace Company, Sherman Kimball & Co., Inc....507 Mission St., S. F.

CLOCKS—TOWER AND STREET
E. Howard Clock Company.....New York
For Pacific Coast agents see advertisement.

COOLERS AND HUMIDIFYERS
California Air Purifying Co.,
Monadnock Bldg

CLOTHES DRYERS
The Hill-Canton Dryer Company, Canton, O.
Neponset Waterdyke Felt and Compound manufactured by F. W. Bird & Son, East Walpole, Mass.; sold by Parrott & Co.,
320 California St., S. F.

COMPOSITION FLOORING
Fibrestone & Roofing Co.,
704 Market St., S. F.
Indestructible Floor Tiling Co., 251 Kearny St., S. F.
Lithoid Products Co., Merchants Exchange Bldg., S. F.

CONCRETE AGGREGATES
Dodge & Lathrop.....Rialto Building, S. F.

CONCRETE CONSTRUCTION
"Mushroom" System of Concrete Flat Slab Construction Industrial Engineering Co.,
Clunie Bldg., S. F.
H. M. Scarrett..Turk and Jones Streets,
Los Angeles
Foster, Vogt Co.....Sharon Bldg., S. F.
Richard Keatinge & Son,
693 Mission St., S. F.
Petersen, H. L. .....62 Post St., S. F.
Ransome Concrete Company,
Oakland and Sacramento
F. J. R. Rickon.....1859 Geary St., S. F.
F. J. Klenck.....Sharon Bldg., S. F.

CONCRETE MIXERS
Austin Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., the Beebe Company, Portland and Seattle, and P. B. Engh, Los Angeles.
Foote Mixers sold by Edw. R. Bacon,
40 Natoma St., S. F.
Ransome Mixers, sold by Norman B. Livermore & Co....Metropolis Bank Bldg., S. F.
Smith Mixers sold by Parrott & Co., San Francisco, Los Angeles and Portland.
Wallace Concrete Machinery Co.,
Monadnock Bldg., S. F.
Marsh-Capron Mixers, sold by Langford, Bacon & Myers, Rialto Bldg., S. F.
Koehring Mixer, sold by Harron, Rickard & McCone, San Francisco.

CONCRETE PILES
Harron, Rickard & McCone.
Townsend Street, San Francisco.
Portland Concrete Pile Co.,
754 Phelan Bldg., S. F.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

Specify... **For Plastering**
HOLMES DIAMOND SANTA CRUZ LIME
PHONE KEARNY 2220
The Holmes Lime Co.
Guaranteed Against Pitting or Popping
Monadnock Bldg., San Francisco

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle
Clinton Welded Reinforcing System, L. A. Norris, Monadnock Bldg., S. F.
"Kahn System," see advertisement on page 152 this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., S. F.
Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

CONCRETE BRICK AND TILE
Golden Gate Concrete Products Co., Inc. 404 Rialto Bldg., S. F.

CONCRETE CHIMNEYS
Delta Construction Co., 302 Forum Bldg., Sacramento Cal.

CONCRETE SILOS
Delta Construction Co., 302 Forum Bldg., Sacramento, Cal.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Buswell's Steel and Concrete Paints, Oakland, Cal.
"Concreta," sold by W. P. Fuller & Co., S. F.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
Moller & Schumann...1023 Mission St., S. F.

CONTRACTOR'S EQUIPMENT
Burt E. Edwards,....1025 Phelan Bldg., S. F.
C. H. & E. Mfg. Co., Inc., Milwaukee, Wis., represented by Parrott & Co., S. F., Beebe Co., Portland, A. F. George, Los Angeles, E. P. Jamison, Seattle.

CONTRACTORS, GENERAL
Commary-Peterson Co., Inc., 46 Kearny St., S. F.
F. J. Klenck.....Sharon Bldg., S. F.
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Foster, Vogt Co.....Sharon Bldg., S. F.
Geo. W. Boxton.....Hearst Bldg., S. F.
Holm & Son.....Foxcroft Bldg., S. F.
McLaren & Peterson.....Sharon Bldg., S. F.
Northern Construction Co., Mills Bldg., S. F.
Higginson Co., Inc., 804 Humboldt Bank Bldg., S. F.
Graham & Jensen....185 Stevenson St., S. F.
Ransome Concrete Co., 1218 Broadway, Oakland
F. J. Rickon, C. E., 1859 Geary St., S. F.
Robert Trost....26th and Howard Sts., S. F.
Williams Bros. & Henderson, Holbrook Bldg., S. F.
Burt T. Owsley....311 Sharon Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal.
Ward & Goodwin.....Sharon Bldg., S. F.

CORK TILING
David J. E. Kennedy, Inc. Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., S. F.
Levensaler-Speir Corporation, 259 Monadnock Bldg., S. F.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Goheen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing, manufactured by Hercules Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Lithold Product Company, Merchants Exchange Bldg., S. F
Trus-Con Damp proofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F
Liquid Stone Paint Co....Hearst Bldg., S. F.

DISAPPEARING IRONING BOARDS
F. G. Cox.....933 Phelan Bldg., S. F.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Allith-Prouty Co., Danville Ill., 693 Mission St., S. F., and 412 E. 3rd St., Los Angeles

DOORS—DISAPPEARING
Pacific Tank & Pipe Co.,231 Berry St., S. F.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.
Wells & Spencer Machine Company, 173 Beale St., S. F
Excelsior Dumb Waiters, manufactured by R. M. Rodgers Co., Brooklyn; M. E. Hammond, 217 Humboldt Bank Bldg., S. F.

CALIFORNIA MARBLE

Seven Different Grades—Superior Finish—Moderate Price

Used in the New San Francisco Hall of Justice, Merchants Exchange Building Alaska Commercial Building, and others.

COLUMBIA MARBLE COMPANY

268 MARKET STREET, Rooms 201-202 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 704 Market St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Garden City Electrical Co.....San Jose, Cal.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.

ELECTRICAL ENGINEERS
Hicks & Folte.....320 Market St., S. F.

ELECTRIC HEATING
The Prometheus Electric Plate Warmer, M. E. Hammond, agent, Humboldt Bank Bldg., S. F.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., S. F.

ELEVATORS
Otis Elevator Company,
Stockton and North Point, S. F.
Van Emon Elevator Co..54 Natoma St., S. F.
Wells & Spencer Machine Co.,
173 Beale St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co.,
593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
J. C. Hurley..... 12 Geary Street, S. F.
Hunter & Hudson.....Rialto Bldg., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co.,
593 Market St., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE DOOR HARDWARE
Allith-Prouty Co., Coast agencies, 693 Mission St., S. F., and 413 E. 3d St., Los Angeles.

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1274; Home, J 3435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co..
507 Montgomery St., S. F.
Levensaler-Spier Corporation,
259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., Head Bldg., S. F.
Gladding, McBean & Company,
Crocker Bldg., S. F.
Los Angeles Pressed Brick Co.,
Frost Bldg., L. A.
Roebling Construction Co., Crocker Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIREPROOF PARTITIONS
Rabbitt Partition Co., 34 Ellis St., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLOOR VARNISH
Bass-Hueter and Works, S. F. Pioneer Varnish 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works,
Chicago, New York and S. F.
Moller & Schumann Co.,
1022 Mission St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co.,
704 Market St., S. F.
Mallott, Peterson & Adams,
682 Monadnock Bldg., S. F.

FORMS FOR CONCRETE
Metal form work, sold by California Sales & Supply Co.....San Diego

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit,
Bowser & Co. .....612 Howard St., S. F.

GARBAGE CHUTE
Bill & Jacobsen.....524 Pine St., S. F.

GLASS AND GLAZING
W. P. Fuller & Co.,
San Francisco, Los Angeles and Portland.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co.,
Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Dodge & Lathrop.....Rialto Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
Niles Sand, Rock & Gravel Co.,
Mutual Bank Bldg., S. F.

HARDWARE
Pacific Hardware & Steel Co..S. F. and L. A.
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.
Window Adjusters, mfrd. by The Casement Co..... 175 State St., North Chicago, Ill.
Allith-Prouty Co., 693 Mission St., S. F., and 413 E. 3d St., Los Angeles.

HARDWOOD FLOORING
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

HARDWOOD LUMBER
Parrott & Co.....320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.

WATER HEATERS - PUMPS
BOILERS

F. HARVEY SEARIGHT
SHREVE BLDG. SAN FRANCISCO

WELLS AND SPENCER MACHINE CO.
F. M. SPENCER, SUCCESSOR
173-177 BEALE ST., SAN FRANCISCO
REPRESENTING
WESTERN ELEVATOR COMPANY
REPAIRS, INSPECTIONS AND DUMB WAITERS
TELEPHONES: KEARNY 664
HOME J 1124

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD LUMBER—Continued
Strable Mfg. Co.,
First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater, sold by Thos. Thieben & Co. .....667 Mission St., S. F.

LOCKERS
Keyless Lock Co.,.....Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office,
Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co.,
Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F.
J. C. Hurley..... 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
Monadnock Bldg., S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOTELS
The Angelus, Loomis Bros.....Los Angeles

HOLLOW BLOCKS
Atlas Stone Co.....663 Mission St., S. F.

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.

INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
418 Montgomery St., S. F.
Smith, Emery & Co. Inc.,
651 Howard St., S. F.

INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.

INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co.,
155 New Montgomery St., S. F.

KEENE CEMENT
American Keene Cement,
Levensaler-Speir, Corporation,
259 Monadnock Bldg., S. F.

LIME
Holmes Lime Company,
Monadnock Bldg., S. F.
Shasta Lime Products Company,
1550 Bryant St., S. F.

LIGHTING FIXTURES
Adams, Hollopeter & Mallett,
353 Sutter St., San Francisco

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So.....Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co.,
Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co.,
Pacific Bldg., S. F.
Roebling Construction Co.,
San Francisco and Los Angeles
Pratt Building Material Co.,
Hearst Bldg., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc.,
Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metallic Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.

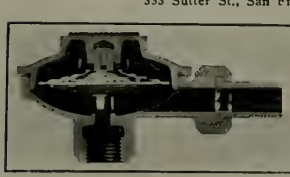
METAL FURNITURE
Dahlstrom Metallic Door Co., represented by M. G. West Co..353 Market St., S. F.
The Keyless Lock Co.....Indianapolis, Ind.
Van Dorn Iron Works Co.....Cleveland, O.
M. G. West Co.....353 Market St., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.....220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co.,
275 Connecticut St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co.,
349 Seventh St., S. F.
I. G. Braun.....Chicago and New York
Ralston Iron Works,
20th and Indiana Sts., S. F.
Standard Iron Works,
235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc.,
19th and Minnesota Sts., S. F.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.



The Dunham Radiator Trap
Makes Good on Every Essential Point, Send for Catalog
Western Division Office
C. A. DUNHAM CO. - 602-18 Monadnock Building
SAN FRANCISCO PHONE SUTTER 2548

CONCRETE FLOORS MADE { WEAR-PROOF / DUST-PROOF / WATER-PROOF } at 2¼c Per Sq. Ft. with

May we tell you more about it?

ALLEN M. OLINGER, Dist.,
24 California St., SAN FRANCISCO, CAL.

METALCRETE

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE—Cont'd.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works,
861-863 Howard St., S. F.

PAINT FOR BRIDGES
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Joseph Dixon Crucible Co., Coast branch, 155 Second St., S. F.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Ad-el-ite paint, sold by Comyn-Mackall & Co., 310 California St., S. F.
Comyn-Mackall & Co., 310 California St., S. F., agents for Ad-el-ite Paints.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors

PAINT SPECIALTIES
Comyn-Mackall & Co., 310 California St., S. F., agents for Ad-el-ite Paints.

PAINTS, OILS, ETC.
Bass-Hueter Paint Company.
Mission, near Fourth St., S. F.
R. N. Nason Company.....San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Moller & Schumann Co.,
1022 Mission St., S. F.
Berry Bros.....250 First St., S. F.
Paraffine Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.

PAVING BRICK
Vallejo Brick & Tile Co.,
343 Sansome St., S. F.

PHOTO ENGRAVING
California Photo Engraving Co.,
121 Second St., S. F.

PHOTOGRAPHY
R. J. Waters Co.....717 Market St., S. F.
Walter Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons,
112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company,
I. W. Hellman Bldg., Los Angeles
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works,
Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation.....259 Monadnock Bldg., S. F.
"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.
Herman Bosch.....4420 20th St., S. F.

PLUMBING
Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Coleman.....706 Ellis St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co.,
978 Howard St., S. F.
Kohler Co.....1001 Monadnock Bldg., S. F.
Glauber Brass Mfg. Co.,
Cleveland, O., 1107 Mission St., S. F.
Louis Lipp Company, Winton Place, Ohio. Pacific Coast Office, 693 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works,
Mills Bldg., S. F.

POWER PLANT EQUIPMENT
F. Harvey Searight...817 Shreve Bldg, S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company.....San Francisco, Seattle, Portland and Los Angeles

RADIATORS
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.
Langford, Bacon & Myers,
Rialto Bldg., S. F.

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton, Sts., S. F.
Automatic Refrigerating Co.
Holbrook Bldg., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F.

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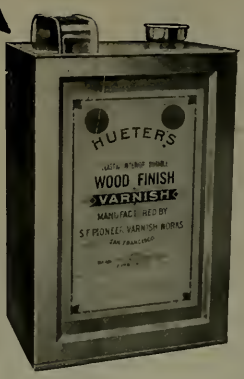

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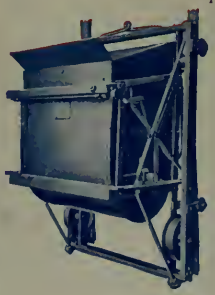

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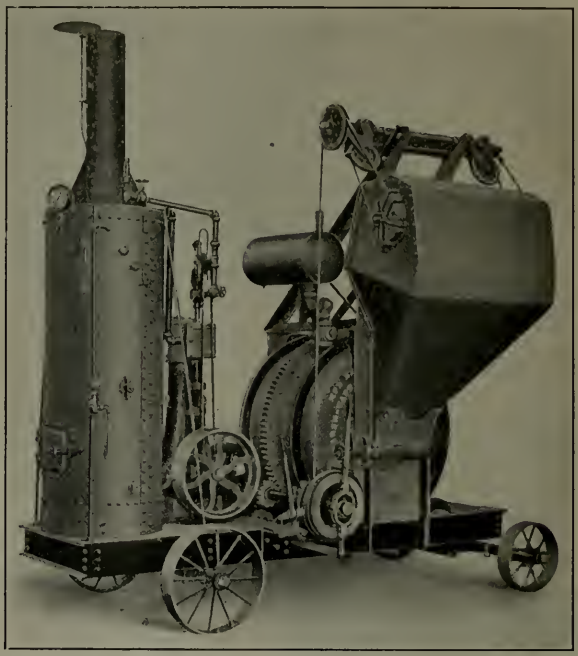

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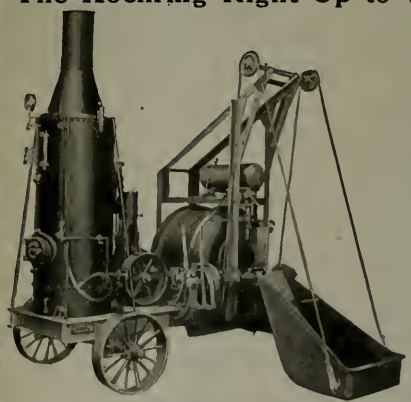

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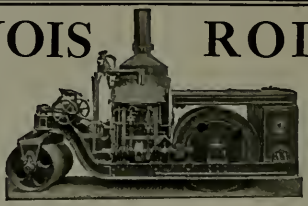

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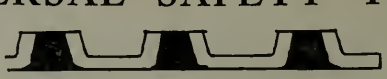

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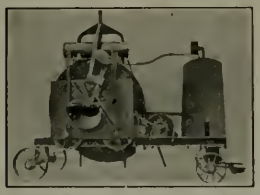

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CHARLES PETER WEEKS, ARCHITECT

Frontispiece
The Architect and Engineer
of California
for August, 1913.

THE
Architect and Engineer
Of California
Pacific Coast States

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VOL. XXXIV. AUGUST, 1913. No. 1

How the Alameda Hospital Competition Was Won

By CHARLES PETER WEEKS, the Winner

A COMPETITION is an examination in architecture. There are occasions when a competitor has a broader knowledge of the subject than is expressed in the program, and then it is that a disregard of program produces a brilliant creation that is successful. But in the majority of cases the competitor who answers the greatest number of questions asked in the program passes the best examination and wins the prize.

The program for the recent Alameda County Hospital and Infirmary competition was so carefully written that to disregard it would have been fatal. And the successful design was an attempt by its author to produce an arrangement of units that in themselves and as a whole were, to the best of his judgment, a proper answer to the questions propounded. No question was slighted and the result justified the labor.

The requirements of the Institution divided themselves naturally into three main groups. The Administration and Hospital group, the Men's Dormitory group, and the Women's Domitory group; each in turn had its head and appendages. Thus the Administration building became the head with the Wards and Nurses' Home as appendages; then the Men's Day Hall with its Dormitories, etc. It became apparent early in the study that the Domestic building was to become the pivotal point around which the different groups would revolve as it was required to be directly connected to all three main groups

That question being decided it was necessary to try to place the central building in such a way that all of the buildings would conform to the contours of the ground as far as possible, have the correct orientation and be located in proper relative importance.

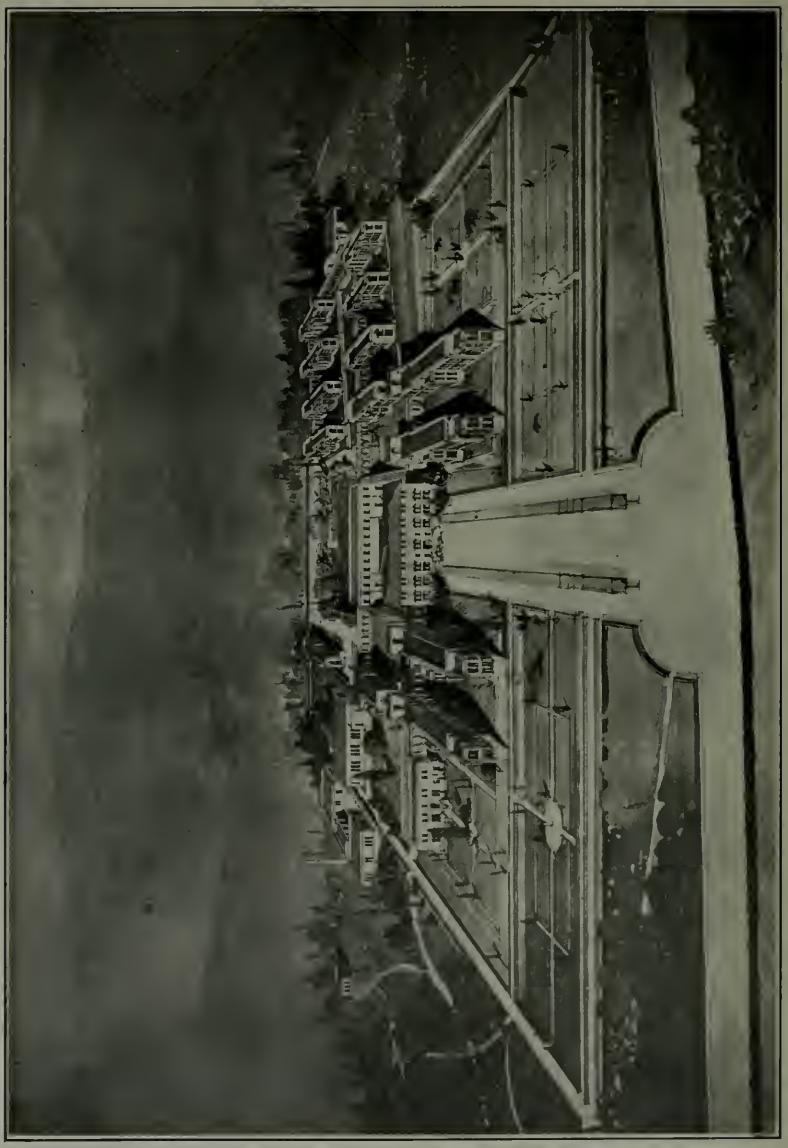
If a main axis was used, the Administration building, owing to its organic and architectural importance, must be on it, thus forcing the Domestic Building on the main axis.

At this time in the study the Lake that exists on the grounds began to play an important part. In fact, like a sore thumb, it demanded attention at every turn. It became so important at the end that it, too, had to come on the main axis.

It was found by using a cross axis back of the Domestic building and arranging the Men's and Women's groups at either end facing the Lake, that proper segregation of sexes, quite sunny seclusion and a nice homelike character could be obtained and the Infirmary and Hospital kept apart.

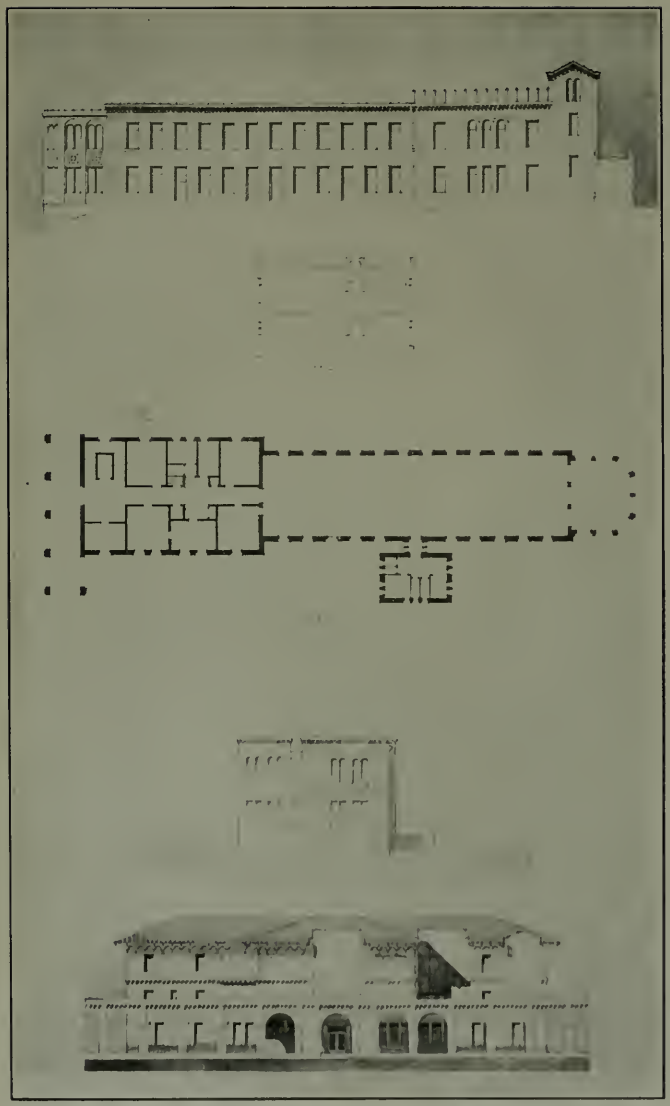
The different buildings were studied to give the best of modern hospital arrangement and equipment.

The exterior architectural treatment is such as to indicate the character of the occupancy and at the same time give a dignified interesting group of buildings.

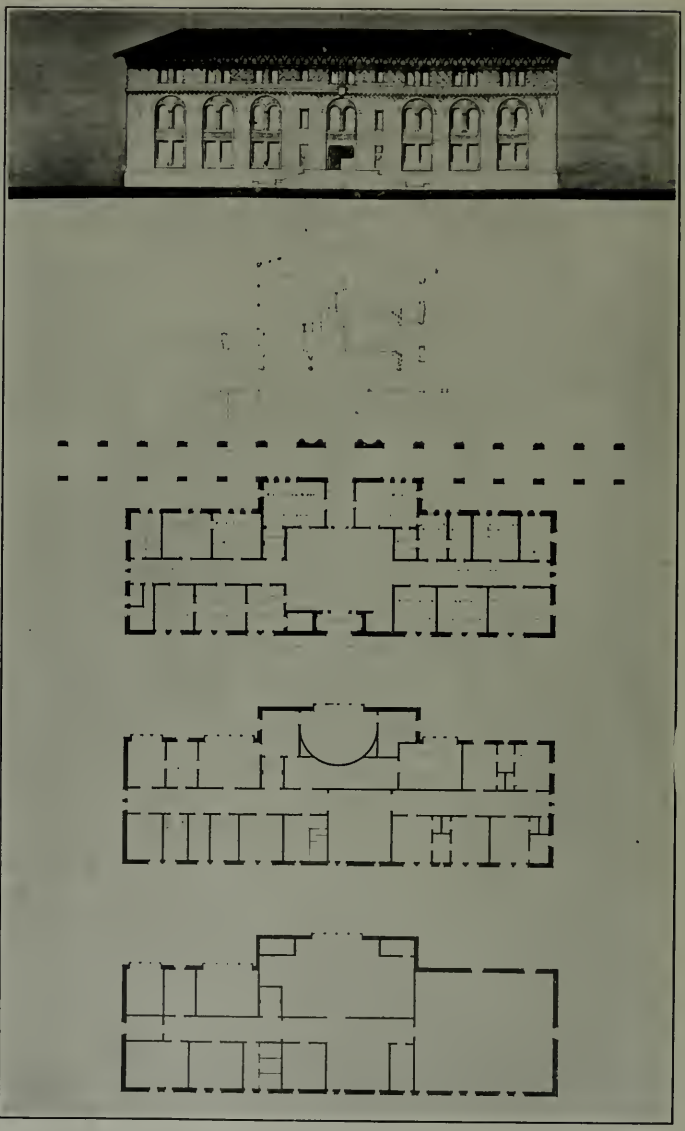


Bird's-Eye View of Alameda County Hospital and Infirmary Group

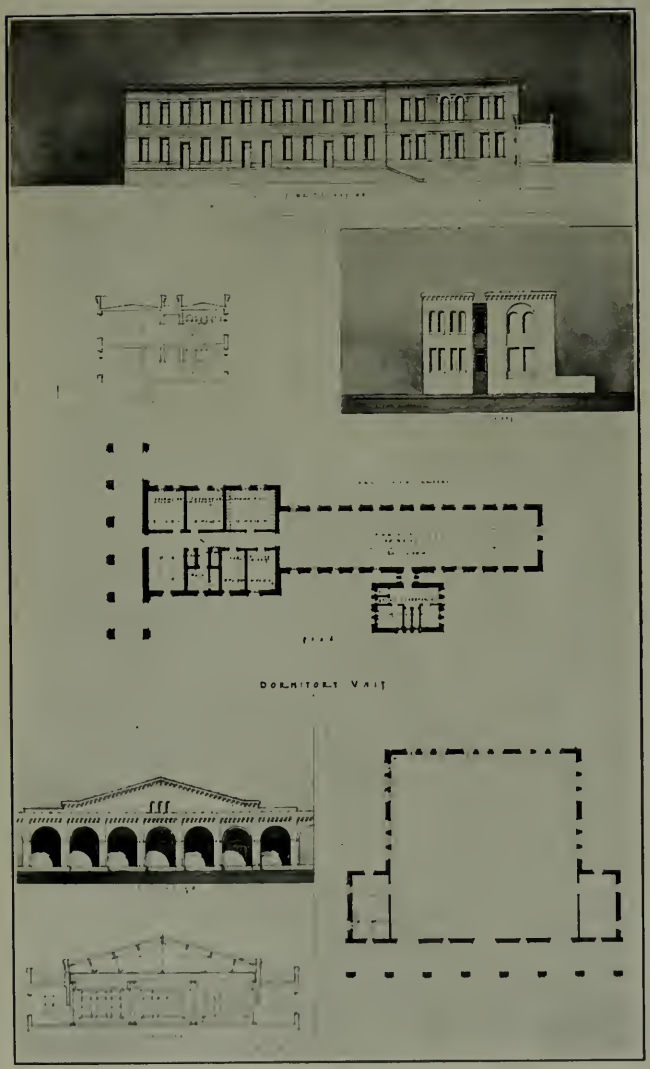
Charles Peter Weeks, Architect



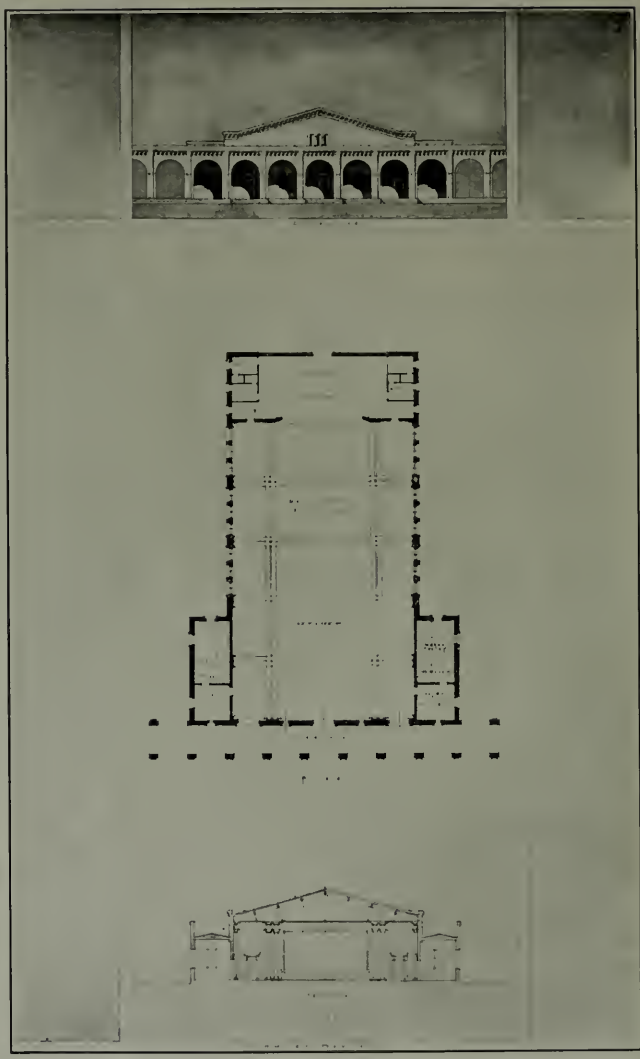
Administration Building, Accepted Design for Alameda County Infirmary Group
Charles Peter Weeks, Architect



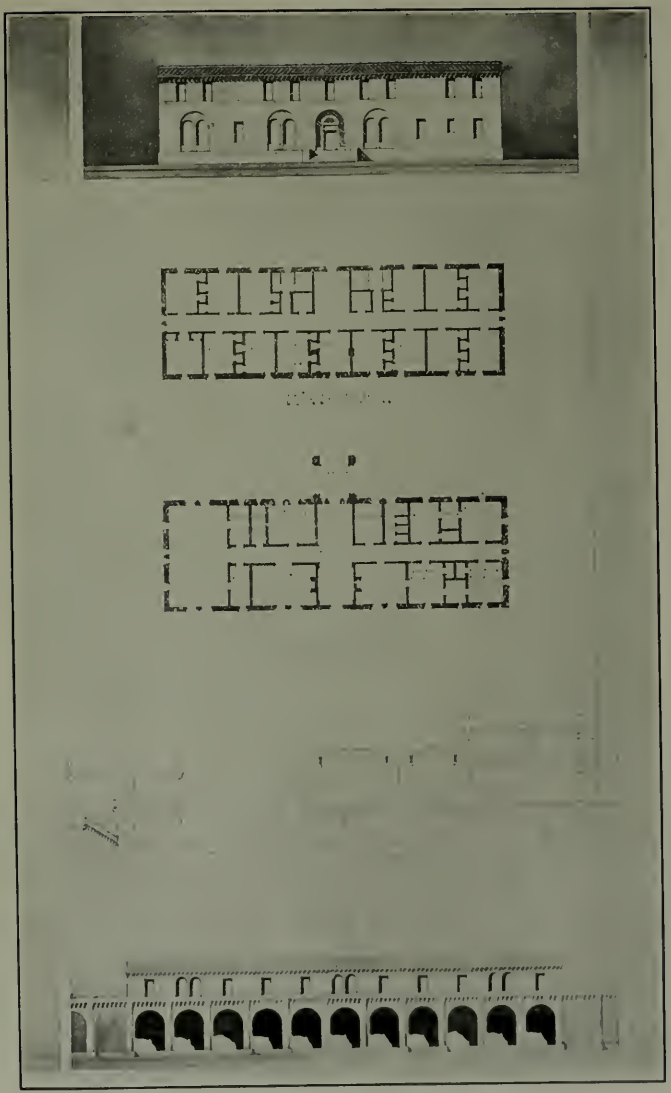
Front Elevation and Floor Plans, Administration Building, Alameda County Hospital Group
Charles Peter Weeks, Architect



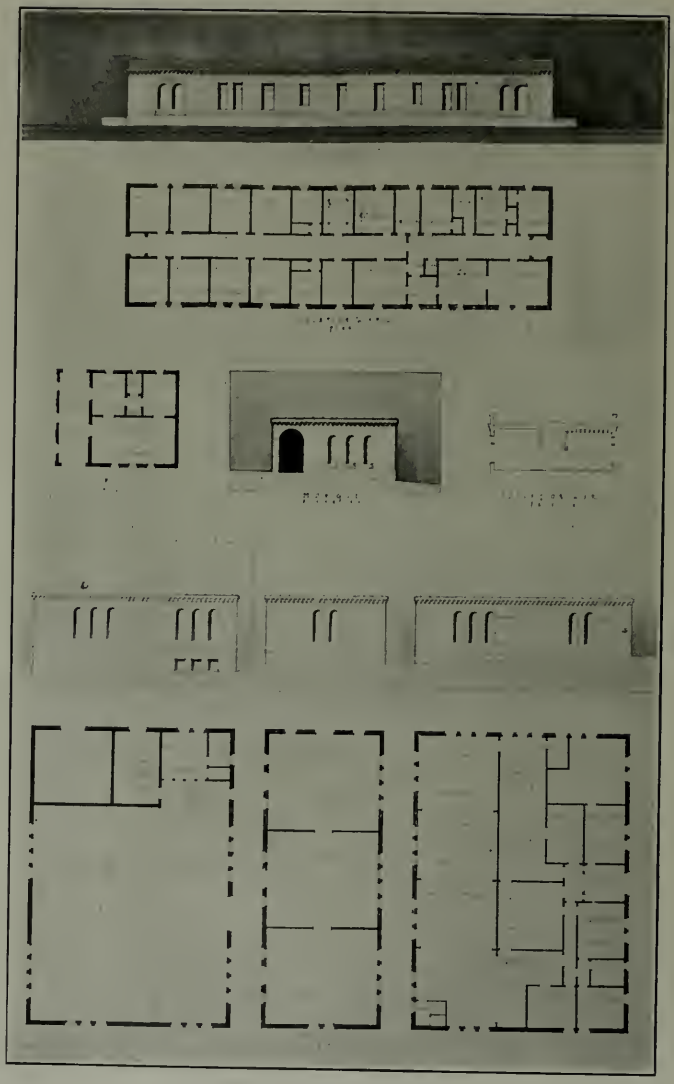
Men's Day Hall, Alameda County Hospital Group
Charles Peter Weeks, Architect



Women's Day Hall, Alameda County Hospital Group
Charles Peter Weeks, Architect



Domestic Building, Alameda County Hospital Group
Charles Peter Weeks, Architect



Isolation Ward, Alameda County Hospital Group
Charles Peter Weeks, Architect

Block Plan, Alameda County Hospital Group
Charles Peter Weeks, Architect

Fraternity House, Berkeley, California
Charles Peter Weeks, Architect

Interior of Fraternity House, Berkeley
Charles Peter Weeks, Architect

In studying the plan of the grounds it was thought advisable to lead a main driveway to the Dormitory Court far enough from the hospital group to enable visitors to see the institution without going through the Administration building.

The vast amount of labor connected with the solution of a problem of this kind is not appreciated by the laymen. Hundreds of plans are made and discarded. Ideas coming at odd times are jotted down for future study. Selection between two or more solutions must be made, realizing that on the judgment probably depends success or failure: All of these things make the work of a competition nerve racking, but exceedingly interesting.

* * *

Draws the Line

Architect—Now, where would you prefer the drawing room, sir?

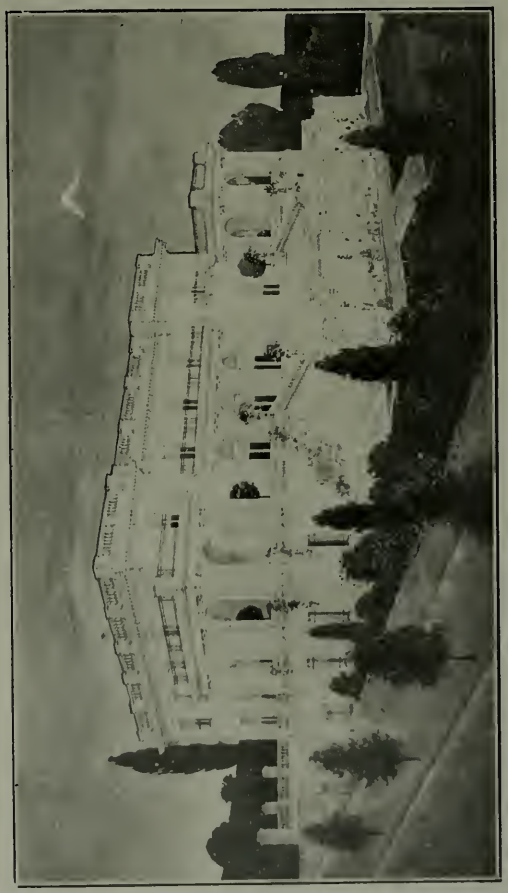
Mr. Strukile—Look here, young man, I've let you put up a smokin' room, when I don't smoke; a music room, when I couldn't play a mouth organ; a nursery, when I ain't got no nurse, and a pantry, when I don't pant. But I'm goin' to draw the line at a drawing room when I couldn't even draw a straight line.

* * *

Cool Seats

Fussy Old Lady—I want two good seats for this afternoon in the coolest part of the house.

Ticket Agent—All right, madam, here are two in Z row.—Life.



Residence of Mr. Edson F. Adams, Oakland
Charles Peter Weeks, Architect

Hacienda Hotel, San Francisco
Charles Peter Weeks, Architect

Fig. 1. Concrete Retaining Walls for Terracing Greenwich Street, San Francisco

A Notable San Francisco Street Improvement

By O. P. SHELLEY, Assoc. Mem. Am. Soc. C. E.

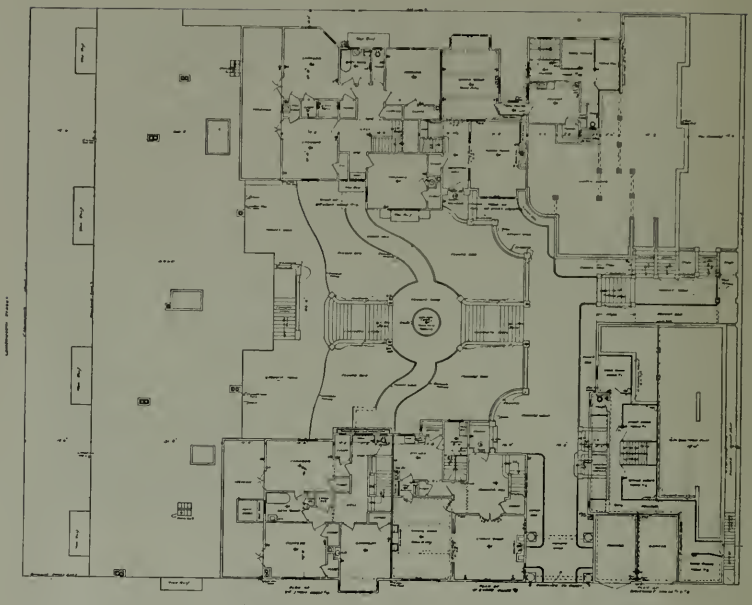
ONE of the greatest drawbacks to the progress of San Francisco lies in the excessively steep grades of much of the residence districts, and especially in those districts which would otherwise be most accessible for apartment house use. So far, no attention has been given to obviating these natural disadvantages; they have always been assumed to be inherent, and therefore unavoidable, and it is because of this that we are pleased to bring forward this rational treatment of Greenwich street, between Leavenworth and Hyde, by Civil Engineer Edward J. Morser.

Much interest was aroused in this location by the Community Dwelling House, which has just been erected by Architects Ross & Burgren, an article and views, having appeared in the November 1912 issue of The Architect and Engineer. The treatment by these architects of the problem was also an unusual one, as they terraced the building so as to make each apartment or dwelling have its individual entrance on a court, and its own outlook and roof garden space, giving an individuality to each section of the community dwelling, and rendering possible the use of the entire site for the building. However, this treatment necessitated a single entrance and for transportation and for other reasons, it was necessary that the mode of ingress and egress be Greenwich street to Hyde, and it is with this street improvement that Mr. Morser's work lies.

Fig. 3. Greenwich Terrace Apartments, San Francisco *Ross and Burgren, Architects*

Fig. 2. Showing Sharp but Graceful Curves to Concrete Retaining Walls Greenwich Street, San Francisco

Greenwich Street Hill Before Terracing



Floor Plan, Greenwich Terrace Apartments

The original grade of Greenwich street, which, by the way, is some 70 feet wide between property lines, was for the upper 210 feet practically impossible for traffic, as it rose over 40 feet vertically in this distance. This was followed by a reasonably level space of about 100 feet, and the balance of the distance to Leavenworth street, being exceedingly abrupt, prohibited any approach for automobile traffic on this latter grade. Mr. Morser's treatment was to terrace Greenwich street, zigzagging from side to side of the old Greenwich street width. The illustration (Fig. 1) shows very clearly the concrete retaining walls for the terracing, the winding road and the sloping lawns, all of which tend to make the treatment very artistic. The winding road itself, which is about 14 feet wide, makes four complete semicircles to a radius of about 15 feet, and has only about 14 per cent maximum grade, whereas the original grade was considerably over 20 per cent. The concrete retaining walls were all coated with "Gunite" shot from the cement gun, giving a natural soft texture to the finish which is inherent with that material, and doing away at once with the roughness of concrete or the artificiality of hand plaster.

The cost of the entire work was extremely reasonable, amounting to about one-half what it would, had an attempt been made to grade down and utilize Greenwich street for vehicular traffic, all the way from Leavenworth to Hyde streets. In addition to the winding street, a four and a half foot sidewalk runs up each side along the property lines, and easy access is given

both automobiles or foot passengers, to the property on either side of the street.

The recent adoption by the San Francisco Board of Supervisors of an ordinance authorizing the use of armored concrete curb for all except a very restricted central district, in the City and County of San Francisco, greatly facilitated this improvement, as granite curb would have been excessively expensive in these sharp reverse curves, and in any case would have been rapidly worn away by the excessive grinding of the wheels going around the various curves. The "Wainwright System" of armored concrete curb which was used, is standing up under the work perfectly. The curb blends with the concrete retaining walls and sidewalks, and gives a smooth, even look, which, on the sharp curves, both horizontal and vertical, would have been impossible with the use of granite. Figure 2 shows very clearly the sharpness of curvature and the steepness of grade on which it was necessary to lay the curbing, and also shows very clearly the bronze electroliers which were used, and while giving efficient light at night, tend to relieve any monotony of the treatment in the daytime. Figure 3 which was given in the issue previously mentioned, showing the Greenwich Terrace improvement as a whole, is repeated for the reason that it will illustrate very clearly, the possibilities of such street improvement in San Francisco. There are a great many other streets in the vicinity of Russian Hill, etc., which could be made available for practical use, by just this class of improvement, which would not only bring up property values far in excess of the cost of the work, but would render it attractive and exclusive, giving as it does, the effect of a restricted residence park with a private entrance.

* * *

Oak Flooring

FINE hardwood floors were a matter almost unheard of fifty years ago, as the processes of manufacture were such that they were found only in the most expensively finished rooms, such as ball rooms, halls and occasionally the drawing room, in the finest residences. Then, too, social custom decreed that the houses of that period should have the floors carpeted, but as the merits of hardwood floors from a sanitary standpoint as well as from their beautiful finish became better known, more and more people demanded that hardwood floors be used in their houses.

In many houses where carpets were used it was thought that almost any flooring material was good enough as it was entirely covered. For this reason many of the finest buildings have soft wood floors which are entirely unsuited for use with rugs or to take a fine polish. In such houses as these, the use of hardwood flooring means that either the flooring must be taken up and relaid at great expense and the accompanying dust and dirt or else a thinner flooring must be used. In such places as these, the use of 13-16 and 3-8-inch thick oak flooring is especially valuable. This flooring is made as a rule in 1 1-2-inch face and in this width, when properly laid, will last indefinitely.

When oak is used, and oak is probably the finest flooring material for this purpose, this flooring can be laid over the old floors without interference with doors or without affecting the baseboards or other permanent built-in fixtures, as the thickness is scarcely greater than a high grade carpet. The cost of 1 1-2-inch face oak flooring in this thickness is much less than the wider and thicker grades and means a considerable reduction in the total cost of the floor.—Construction News.

Best Architectural Work in the United States

THE American Federation of Arts recently undertook to ascertain what were the most satisfactory examples of architecture in the United States and to this end invited an expression of opinion from a selected list of persons, including members of the Federation, prominent supervisors and artists, sculptors and others having a reputation for taste. The result of the canvass showed the following twenty buildings to lead the list, and of this number it will be observed that nine are in New York City:

Boston Public Library.
Capitol at Washington.
New York Public Library.
Pennsylvania Railroad Station, New York.
Trinity Church, Boston.
Columbia University Library.
Congressional Library, Washington.
J. P. Morgan's Art Museum, New York.
Minnesota State House.
Madison Square Garden.
St. Patrick's Cathedral, New York.
Cathedral of St. John the Divine, New York.
West Point Military Academy.
White House, Washington.
New York City Hall.
University of Virginia.
Toledo Art Museum.
Union Station, Washington.
W. K. Vanderbilt's House, New York.
Pan-American Building, Washington.

Following the initial twenty is placed the Metropolitan Tower, University Club and Trinity Church in New York City, and the Museum of Fine Arts in Boston.

* * *

What about some of our California architecture? Bliss & Faville have given San Francisco some very good examples of the classic order and Florentine period—the California Bank, for instance, and the recently completed $1,000,000 Masonic Temple. The State University library at Berkeley, designed by Jno. Galen Howard, is really a very beautiful conception and so is Bakewell & Brown's design for the new San Francisco City Hall. Willis Polk's D. O. Mill's Bank at Sacramento is a striking example of the severe classic. There are others—many in the Southern part of the State, too—that could be added to this list, but after all, what do the Eastern critics know about California architecture?

Maybe after the big fair they will be better able to judge. The exposition should prove the drawing card and on the ground the critics can see and believe.—Ed.

*
* *

As to Floors

"Would you like the floors in mosaic?" asked the architect.

The Springfield man looked dubious.

"Would you like the floors in mosaic patterns?"

"I don't know so much about that," he finally said. "I ain't got any prejudice against Moses as a man, and maybe he knew a lot about the law. As regards laying floors, though, I kinder think I'd rather have them unsectarian."—Harper's Weekly.

*
* *

Heard at the Club

Griggs—I'm sorry about Brown's failure. He's a brick if ever there was one.

Briggs—Then it is not unnatural that he should go to the wall.—Boston Transcript.

Concrete in Its Legal Aspect*

By W. VALENTINE BALL

IN presenting this paper one is beset with certain difficulties. There is no statute law which is specially applicable to the subject in hand, and of reported cases relating specially to concrete there are none. Nevertheless, it has occurred to me that there are certain aspects of the law relating to building and engineering contracts which may be of interest to members of this Institute, and I am indebted to your Council for giving me this opportunity of setting them before you. I hope to draw attention to a few considerations which may properly be kept in view by the parties to a contract which involves the use of concrete or reinforced concrete.

I was prompted to prepare this paper by the fact that I recently came across a contract for the erection of large works which involved the use of 30,000 tons of cement ! It therefore occurred to me that the clauses as to concrete and reinforced concrete which appear in engineering and building contracts are by no means a negligible part of these documents.

In the course of the paper I propose to use the term "employer" to mean the local authority, company, or person who requires the work to be carried out. The term "contractor" will signify the firm of contractors or builders employed directly by the employer, while the term "sub-contractor" will include any firm or company which is employed to carry out some portion of the work under a sub-contract.

General Observations on the Employment of a Sub-Contractor

Your Secretary has been good enough to point out to me that the relations between contractor and sub-contractor are likely to be of special interest to members of the Institute.

In carrying out a large contract the employment of sub-contractors or specialists is very common; indeed, the employment of sub-contractors is almost inevitable when the work in hand is of any magnitude. Whether the work of making ordinary concrete is usually entrusted to a sub-contractor I do not know. But I presume that reinforced concrete will frequently be carried out under a sub-contract. The sub-contractor will be chosen by the engineer or architect acting in the interests of the employer.

Generally speaking, where there is no stipulation against sub-contracting a contractor may employ sub-contractors. The rule is, however, subject to the qualification that it does not apply when the employer reasonably and naturally looks for the personal service and attention of the contractor. Thus, if the work in hand were of a highly special character, it would not be competent for the contractor who was skilled in that class of work to hand over its performance to some one else.

The following clause may be inserted if it is desired to ensure that the contractor shall carry out all the work himself:

> "This contract is and shall be considered as a personal contract by the contractor himself, who shall personally, with the assistance of skilled foremen, agents, mechanics, and workmen, direct and execute the works."

The more approved practice, however, is to leave it to the engineer to say whether and how far sub-contractors may be employed. The following clause, which is to be found in the model conditions approved by the Institute of Electrical Engineers, may safely be used:

*Extracts of a paper read at the Thirtieth General Meeting of the Concrete Institute, January 9, 1913, at Westminster, S. W.

"The contractor shall not, without the consent in writing of the engineer, assign his contract, or any substantial part thereof, nor under-let the same, or any substantial part thereof, nor make any sub-contract with any person or persons for the execution of any portion of the works, other than for raw materials, for minor details, or for any part of the whole for which the makers are named in the contract."

Who is Liable to Pay the Sub-Contractor?

A most important question from the point of view of the sub-contractor is, Who is liable to pay him? He naturally wants to be sure that his labor will not be in vain. Generally speaking, the employer is not liable to a sub-contractor, unless an agreement between them can be proved. Such an agreement will not be implied from the mere acceptance of the sub-contractor's work. Thus, if A were to ask you to lay the concrete foundations for B's house, and you did the work, the mere fact that B accepted it and thanked you very much, would not make him liable to pay for it. For instance, where an employer contracted with a builder to do certain work on his house, and a tradesman supplied goods to the builder for use on the house, it was held that the employer was not liable for their price. The employer does, however, become liable if it can be shown that there is a contract between him and the sub-contractor. For instance, in another case a contractor employed a mason to do certain work as extra to the contract. In an action for work and materials by the mason against the contractor's employer the plaintiff stated that the work in question was extra to the contractor's contract, and that he had agreed with the contractor to do the work. On production of the contractor's contract the jury found that there was a distinct contract between the mason and the employer for the work sued on, and judgment was entered for the plaintiff. (*Eccles* v. *Southern*, 1861, 3 F. and F. 142).

An employer may also become liable to a sub-contractor by going surety for him. In that case, however, there must be something in writing, as a contract of guaranty cannot be sued on unless it is in writing. But there is a difference between a promise to pay the debt of another and a direct promise to be liable oneself in any event. In the latter case a written contract need not be proved. Thus, if the employer promises to pay the sub-contractor out of moneys which he has to pay to the head contractor, this would be treated as a direct promise to pay.

The question, Who is the sub-contractor to look to for his remuneration? therefore turns upon the conditions of his employment. In the ordinary form of agreement a clause is inserted providing that the contractor will pay to the sub-contractor "the sum of $..... when the engineer for the time being of the employer shall have certified in writing that the said work has been completed and finished to his satisfaction." Other terms are sometimes inserted providing for payment by instalments.

Where the Contractor becomes Insolvent

Trouble frequently arises in cases where, owing to the insolvency of the builder, the sub-contractor is compelled to look to the building-owner. He often makes such a claim without avail; but by means of a special clause this difficulty may be obviated. So *In re Wilkinson* ex parte *Fowler* (1905, 2 K. B. 713), a District Council entered into a contract with a contractor for the construction of certain sewerage works. The contract provided that certain machinery for the works was to be supplied to the contractor by certain specified firms, and that "if the engineer shall have reasonable cause to believe that the contractor is unduly delaying proper payment to the firms supplying the machinery, he

shall have power, if he thinks fit, to order direct payment to them." The contractor having become bankrupt, it was held that the engineer had power to direct the payments to be made to the machinery firms direct. Mr. Justice Bigham said: "I think that the clause means that if the persons supplying machinery to the contractor for the purpose of the contract are not promptly and properly paid by him they can apply to the engineer, and then it shall be competent for the engineer to intervene, and by a proper certificate given in that behalf to require the council to pay to the machinery firms the amount of their accounts directly—that is to say, not through the hands of the contractor at all, but the money is to be paid directly by the council to the machinery firms."

How far the Contractor is Liable

Assuming there is delay in the execution of the work, the question of liability may arise as between the contractor and sub-contractor. One may blame the other, and the employer may leave them to fight it out between themselves.

If an employer reserves to himself the right of employing specialists to do any portion of the work on a large contract, he does not thereby give any implied undertaking to the head contractor that he will be responsible for any damage caused to the builder by any delay or default on the part of the specialists. In the case of *Mitchell* v. *Guildford Union* (1903, 68 J. P. 54) a builder undertook to do the whole of a certain piece of work for a certain sum, but part of it was to be done by specialists. The builder undertook to finish the work by a certain date unless he was hindered by (*inter alia*) delay on the part of the engineer or specialists. The builder was not to be liable for any defects in work provided by the specialists, unless by the reason of contributory negligence on his part, of his having paid any final balance to the specialists without first having the architects' written authority to do so. In the course of the work there was delay on the part of the specialists, whereby the builder suffered damage. The builder brought an action for breach of contract against the building-owners, alleging that under the contract and specification there was an implied promise on the part of the building-owners that the delivering and pricing should be done at such reasonable times as to enable the builder to complete his work within a reasonable time thereafter, and that the building-owners had broken one or both of these implied promises. It was held that on the proper construction of the contract and specification there was no such implied promise, and that there was no breach of contract on the part of the building-owners affording the builder a right to damages.

Liability of the Sub-Contractor for Delay

The liability of a sub-contractor for delay in completing the work he has undertaken to carry out depends on the terms of his contract with the head contractor. If he does not know that the head contractor has undertaken to do the work within a specified time, he will not be liable for the damages claimed and recovered by the employer for delay; but it is otherwise if it is shown that he knew what would be the consequences of delay.

Use of Material on the Site

It may well be that in some cases the builder or other person who has to provide concrete will find a large bed of gravel or other useful material on the site. How far can he use it in the fulfilment of his contract?

An obligation upon a contractor to clear away old materials does not necessarily vest those materials in him. Again, where a contractor is bound by his contract to excavate, the materials excavated do not necessarily vest in him. On the contrary, if a contractor make use of materials supplied to him, the employer may set off their price against the amount due under the contract. For

instance, in one case the plaintiff contracted to do certain work for the defendant and to find the materials. The defendant supplied part of the materials which the plaintiff made use of in the work. It was held that the defendant was entitled to deduct the value of the materials supplied by him from the contract price (*Newton* v. *Forster,* 1844, 12 M. and W. 772).

The importance to the employer of some clause dealing with old materials lies in the fact that if nothing is said about them the contractor may remove them. Having removed them, he may sell them. In that case, if he were to become bankrupt, the employer could not get the goods back, but would be relegated to his right of proving for their value in the contractor's bankruptcy.

Where the contract for erecting a building or executing other works makes no reference to old materials, it seems that the contractor will be under an implied obligation to clear them away.

It is well for every contractor who has undertaken works which involve the clearance of a site to take care that he is adequately protected. The removal of a large mass of concrete would be a long and costly operation, while to remove reinforced concrete, knit together with ribs of steel, is the labor of Titans. When the time arrives for the removal of modern buildings, it is clear that the contractor must needs regard clearances as a very important item when considering the amount of his tender.

Provision for Water

Another question of importance is the provision of an adequate supply of water. Where there is a good supply at hand in the mains no difficulty need arise. The question will simply be, Is the employer or the contractor to pay the water rate during the work of construction? But if there is no municipal or other supply the difficulty may have to be met by sinking a well or pumping from a lake or river. Suitable clauses must be inserted in the contract to place the burden of pumping or well-sinking on the right shoulders.

Right to Reject Materials

It is important to consider the question whether the architect has the right to reject improper materials when brought on to the works. In this regard the provisions of the R. I. B. A. form appear to be fairly satisfactory.

Phillimore, J., made the following observations upon Clauses 16 and 17 of that form: "Happily in this case I think I have not to definitely construe Clause 16, but it occurs to me that the real businesslike way to construe it is to apply it to emergencies, to things that arise in the immediate course of building which require rather executive than judicial action followed immediately by the judge carrying out his judgment. If a stack of bricks are bad bricks in the sight of the architect for the class of work which is going to be done, and he rejects it, if there is a piece of 'green' work built, the architect or clerk of the works may say, 'That is badly done and must be pulled down and rebuilt.' But when the architect has looked at the work on one of these visits, and has not condemned it, and the contractor has obviously treated it as finished and taken his men off from it, and proceeded to another piece of the work, it occurs to me that Clause 16 ought not to apply. If, in fact, the work is badly done, and mischief follows in consequence, the architect is not without his power, and the employer is not without his protection. The architect then uses Clause 17, and applies the retention money, and in that case he is no longer acting on an emergency. He is acting judicially, and only judicially, and there is the appeal from him to the arbitrator. That seems to me, if and so far as I have to decide it in this case, to be the way of reconciling Clauses 16 and 17." The clause in question is that in which power is given to the architect to order the removal of improper work and to provide for defects after completion.

Supervision when Concrete is being Laid

Concrete is a matter which may require some supervision on the part of the architect. To cover up wet concrete may involve serious disaster, and it seems that, in the conduct of ordinary building operations, it is the duty of the architect to attend to this matter; although in some respects he is an arbitrator, he is also a servant to the building-owner or employer.

If it is true that dry-rot is a defect which will occur in any house, however it may be constructed, it is clear that liability to put it right cannot be fixed upon any one, unless it is specially provided for in the contract. But in the few cases which have been before the courts it has been assumed or proved that dry-rot is a defect which may be caused or brought into existence by bad design—chiefly in matters relating to ventilation—or by bad supervision in the construction of works.

It is proposed to consider some of the cases bearing on the subject. Thus, the fact that an architect may be held liable for negligence for passing bad work is illustrated by a case where the plaintiff employed a builder to build a house for him in accordance with certain plans. The builder was to be paid on the certificates of the defendant, who was the plaintiff's architect. The defendant certified, and the plaintiff accordingly paid the builder. This action was brought by the plaintiff, who alleged that in consequence of the defendant's negligence in superintendence the house was not built in accordance with the contract. The jury found a verdict for the plaintiff.

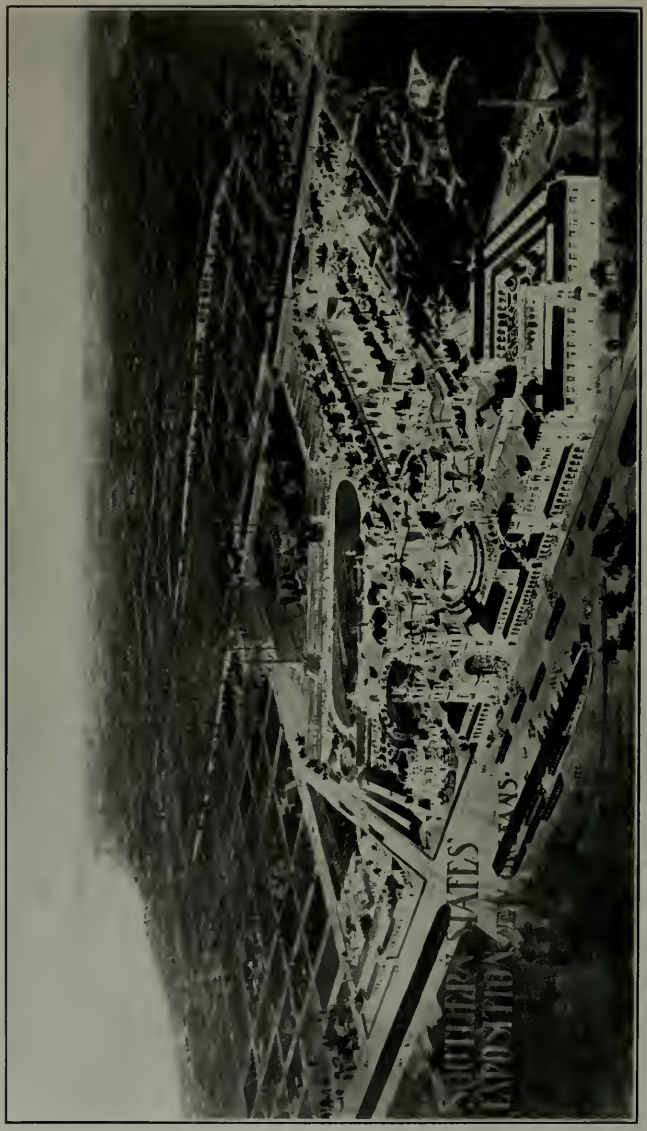
The fact that an architect may be held liable for dry-rot has been clearly established in a Scotch case which is noted in *Emden's Building Contracts*, 4th ed., p. 78. There a builder was employed to build a house to the specification of the defendant, an architect. No clerk of the works was employed. Many months after the completion of the work the whole ground floor became infected with dry-rot. The building-owner made a claim upon the builder, who denied all liability. He then brought an action against the architect, claiming damages for negligence. The Court of Session in Edinburgh held that the architect was liable.

Defects after Completion

I have not sufficient technical knowledge to know whether concrete or reinforced concrete is liable through the mere lapse of time to deteriorate. I remember having heard that "Roman cement," which was used in the building of portions of the Eternal City, was sometimes more durable than the stones which it was used to bind together! In anticipation, however, of the fact that some member of the Institute will enlighten me, I propose to say a few words as to defects after completion.

Take, for instance, the case of a concrete archway. Suppose that it develops a crack within six months of the date of completion, and the contract is silent on the question of liability—what is the legal position? The mere fact that the employer has accepted the bridge and paid for it would not amount to a waiver of his right to damages if the bridge failed through some fault for which the contractor was responsible.

For instance, in one case the plaintiff, a shipowner, bought copper sheathing of the defendant, a copper-manufacturer, and the copper was put on the ship, which sailed; but the copper, instead of lasting four or five years, as usual, corroded in four or five months and became unfit. It was held that the plaintiff could recover damages, notwithstanding the acceptance.



Preliminary Scheme for Southern States Exposition, New Orleans
Stevens & Nelson, Architects *F. W. Fitzpatrick, Consulting Architect*

A Southern Exposition

IN this number is shown a reproduction of the preliminary drawing for the general layout of The "Southern States" Exposition to be held in New Orleans. It is stated that the idea of this exposition is not necessarily to compete with the Panama-Pacific Exposition to be held in San Francisco in 1915, but is the result of a decision of certain prominent Southern merchants and others to create a permanent home for exhibits of the manufactures and products of the South.

The architects selected to carry out the planning and designing of the exposition are Stevens and Nelson of New Orleans, with F. W. Fitzpatrick, of Washington, D. C., as consulting architect.

Writing The Architect and Engineer in regard to the design, Mr. Fitzpatrick says:

"The Architect and Engineer may care to show its readers what the selected architects have submitted in the way of a preliminary design for the Southern States Exposition at New Orleans. There will, of course, be many modifications as the scheme progresses, but this is our first suggestion.

"The idea of that Exposition is not necessarily to compete with San Francisco in its Panama affair but is simply a timely decision to create a permanent home for the exhibits of the manufactures and products of the South and it is also an endeavor to bring those States in closer relationship with the commerce of the Central and Southern Americas, for which commerce New Orleans is the most logical doorway in this country."

Mr. Fitzpatrick is the perpetrator of the painting from which the photograph was made.

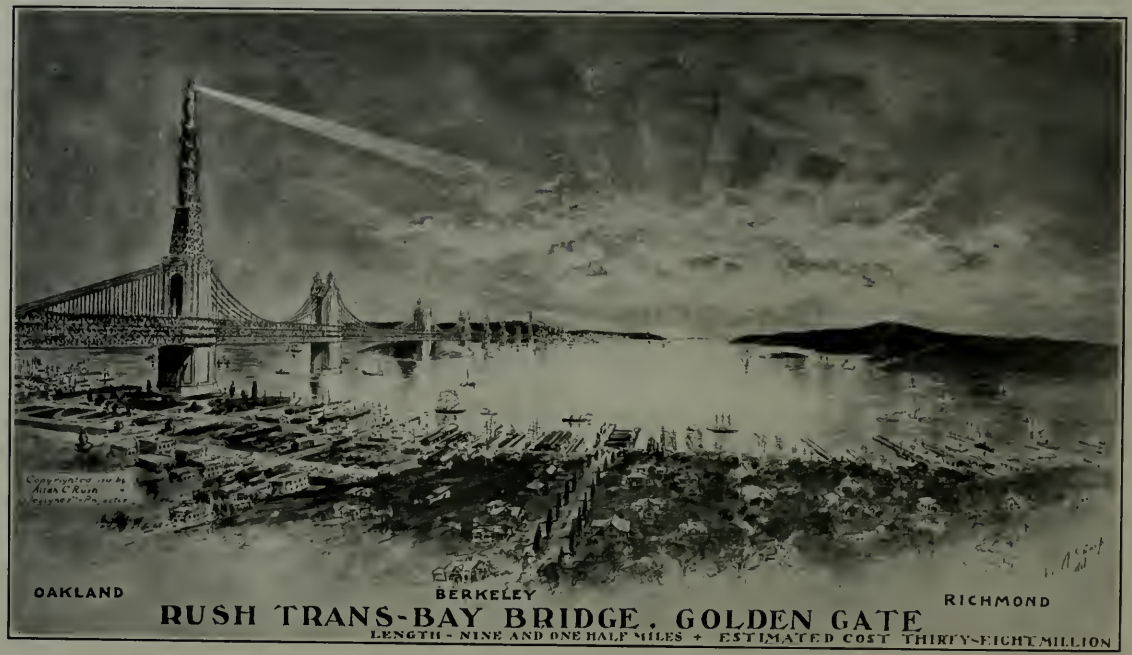
* * *

Beauty and Utility in the Skyscraper

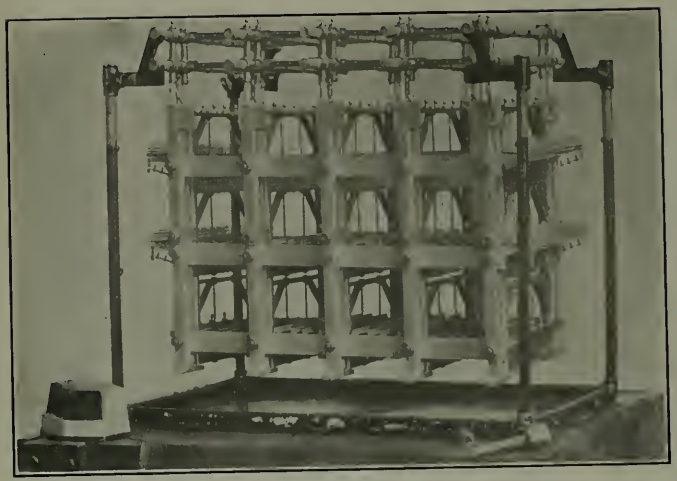
IN St. Louis what is styled "the world's largest business building" is about to be opened. It has twenty-one stories, with an area of 65,000 square feet for each floor. It is light and airy, and evidently well constructed, and no doubt it is in all particulars adequate to the commercial uses to which it will be put. But it is abominably ugly. Its plan is uncompromisingly, pitilessly rectangular and rigid. Each facade presents the appearance of an enormous vertical cucumber frame of multitudinous windows. There is not a single visible attempt at adornment, not a curvilinear effect of any sort to relieve the rows and rows of squares and oblongs and gaunt upright parallels.

By way of striking contrast, take the new Woolworth building, which dominates Manhattan island with an upsoaring shaft of stone that answers to Mme. de Stael's famous definition of architecture as frozen music. This is a building at once useful and beautiful. It nobly asserts above Broadway its spiritual inspiration, just as Trinity church stands at the head of the rush and roar of Wall street like a perpetual minaret and muezzin call. When such results are feasible, what is the excuse for uglifying a downtown city block with the hideous angularity of such a structure as that upreared in the metropolis of the Mississippi valley?

In every American city today there are increasingly abundant examples of the way to build great houses of business that blend the practical and the inspirational values. Philadelphia has a goodly proportion of such ornamental edifices, in which thought was altruistically taken for the improvement of an entire neighborhood. In time, with the contagion of taste and esthetic education, the "cloud-scratching" monstrosity will be an abomination of the past.—Philadelphia Ledger.


OAKLAND
BERKELEY
RICHMOND
RUSH TRANS-BAY BRIDGE, GOLDEN GATE
LENGTH - NINE AND ONE HALF MILES + ESTIMATED COST THIRTY-EIGHT MILLION

Engineers' Perspective Trans-Bay Suspension Bridge, San Francisco-Oakland



Fifty-Foot Section, Rush Trans-Bay Suspension Bridge. Three Stories. Total Length, Nine and One-Half Miles. To Right, Side View of Fifty-Foot Section of the Bridge. To Left, Entrance of Railways and Tramways

Some Engineering Features of the Proposed Trans-bay Suspension Bridge

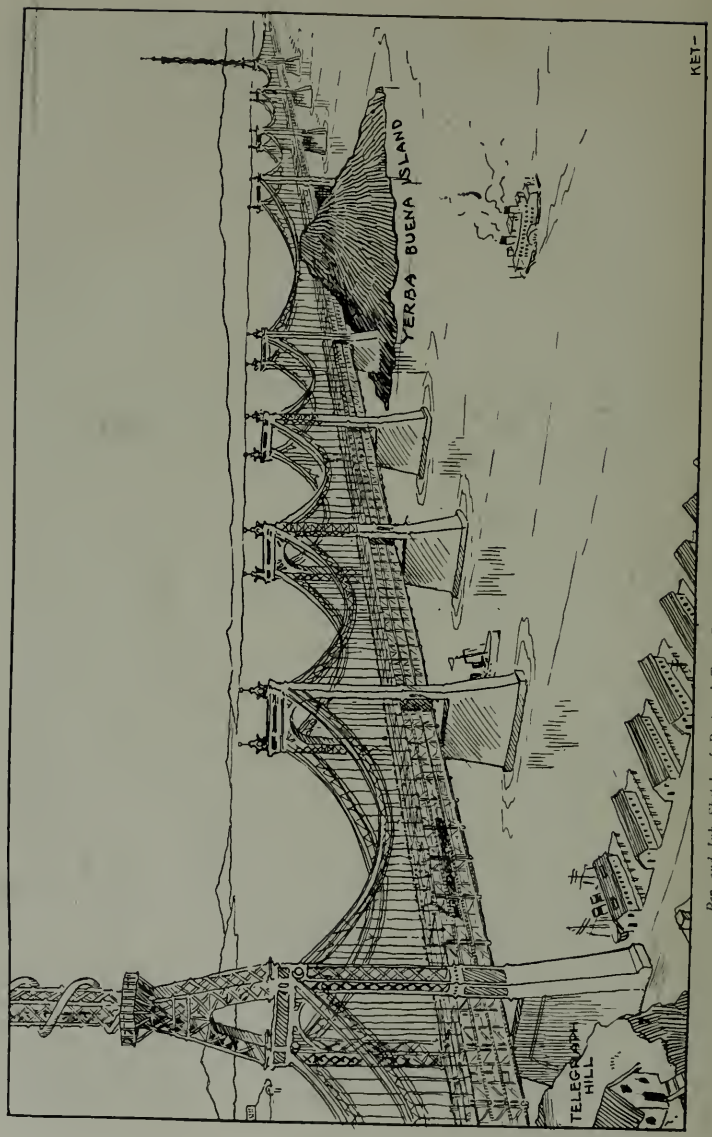
By L. P. CRANE

A YEAR ago the United States Senate passed a bill granting the use of government lands of Yerba Buena Island and the Presidio for the construction of a bridge over the Bay of San Francisco. The bill now awaits the action of the Lower House of Congress.

Whether Congress passes the bill granting the use of Yerba Buena Island for the construction of this bridge, or not, the creative genius of a Californian has given birth to the project, which, if carried to a successful undertaking, will easily rank as one of the foremost engineering wonders of the world.

The design of the bridge, as presented by Allen C. Rush, inventor and builder, differs in many ways from any other plan heretofore presented. One of the points upon which engineers place great emphasis is the flexible construction, which enables the bridge to sway from side to side without injury to any part and which would, in case of seismic disturbances, be of untold value. Each section, which is fifty feet long is connected by thirty pivots, eight inches in diameter by twelve feet in length, by which the structure may sway, expand or contract, and still maintain its level above and at the base of the bridge. There is a special device with eccentric bearings so the bridge is compelled to lift one or more of its parts, or sections, before the whole structure can move out of a perpendicular line, thus it is made self-adjusting in storm.

The weakness in some of our great bridges has been the lack of substitute parts when any one part gave way. To overcome this difficulty, the



Pen and Ink Sketch of Proposed Trans-Bay Suspension Bridge. *Allen C. Rush, C. E.*

proposed bridge is so constructed that each part has a substitute part, and if any one part gives way, another takes its place in holding up the enormous structure. These are ten 20-inch flexible steel cables, having a tensile strength of 35,000 tons each, five of which would be sufficient to hold the structure. The steel structure of the bridge is hung to these ten great cables, which would be anchored in solid rock on Telegraph Hill, San Francisco and Yerba Buena Island in the Bay and from this Island to the base of a great pier located in the tide lands on the East side of the Bay.

The plan calls for ten piers at a distance of 2280 feet apart and for these piers resting in the water of the Bay, a special caisson constructed of steel and reinforced concrete has been designed. This caisson, hexagonal in structure, is 225 feet by 325 feet and 150 feet high, with inner chambers, or tubes and when filled with compressed air will have a buoyancy of approximately 110,000 tons as against 90,000 tons dead weight. It will have a power of resistance to outside water pressure of 16,000 pounds to a square foot as against 9,000 pounds water pressure. The water pressure in San Francisco channel at 140 feet is estimated to reach 9,000 pounds to a square foot. This caisson structure will be floated to the location of the piers; the air allowed to escape from the compartments and the structure sunk. After the water and mud are pumped from the inside and beneath, the caisson will sink to bed rock, and the air compartments filled with stone and granite—thus forming the base of the pier. The bridge will then be built up the required height to receive the ten great cables. The height of the bridge above water level will be 180 feet or more.

At the terminus of the bridge on either side of the Bay, it is the plan to extend the piers up 1200 feet where a tower will illuminate the entire bay for miles around and afford an unobstructed view of the Golden Gate. The bridge will be approximately 50,200 feet in length, or the longest structure of its kind in the world.

* * *

Curious Business for English Architects and Contractors

The following literary curiosity appeared in a recent issue of the London "Builder," having been forwarded to the editor of that paper by the Secretary of the Society of Architects. Obviously the name and address of the firm are omitted:

> ARCHITECTS and CONTRACTORS,
>
> * * * *
>
> Plans and Specifications prepared and Land Surveying carried out on Moderate Terms.
>
> PROPERTY VALUED, CAREFULLY MANAGED AND DEVELOPED.
>
> *Rents Collected and Repairs promptly executed.*
>
> Concrete Flags and Staffordshire Fire Bricks on Sale.
>
> Funerals Completely Furnished and Personally Superintended. Vaults and Brick Graves built on the shortest notice.

No doubt a funeral organized by an architect should have special merits in the eyes of many members of the profession.

Design for Bungalow Church, Berkeley, California
Jas. W. Plachek, Architect

Old Colony Apartments, San Francisco
Falch & Knoll, Architects

Apartment House, Washington and Taylor Streets, San Francisco
Falch & Knoll, Architects

Building for the Macdonough Estate, San Francisco
Smith O'Brien, Architect

The New Hotel Sutter, Sacramento, California. Faced With Sacramento Sandstone Brick Seadler & Hoen, Architects

Bamboo for Reinforcing

Hou-Kun Chow, a student of mechanical engineering at Massachusetts Institute of Technology, is experimenting with Chinese bamboo for concrete reinforcement purposes, having had a quantity shipped to him from his native land. Bamboo is the standard building material of many tropical countries and is widely used also in China. Many Americans traveling in the Orient have suggested the possibility of using bamboo in concrete and the experiment at the Massachusetts school will be watched with interest.

Proposed Elks' Building, Berkeley
W. H. Ratcliff, Jr., Architect

Berkeley Elks' New Home

BERKELEY'S proposed new Elks' building is shown above. The design is by Architect W. H. Ratcliff, Jr., of Berkeley, whose plan was accepted in open competition with several other Berkeley, Oakland and San Francisco architects. The perspective shows an attractive exterior in the semi-classic order with plain but finished lines.

The entire building has been designed for the Club's exclusive use. The plans call for a three-story and basement building with a frontage on Allston way of 100 feet and a depth on Henry street of 80 feet. The basement will contain a large banquet and jinks room; the first floor an elaborate club room with library, card and billiard rooms, dining, lounging and smoking rooms, an entrance foyer with monumental stairs, a loggia overlooking gardens in the rear, and all the appurtenances of a modern club. The upper stories are given over to living apartments for members and a large lodge room with a fully equipped stage The estimated cost is $100,000.

* * *

Pennsylvania is the Star Cement Producer

The production of Portland cement in the United States in 1912 was 82,438,096 bbl. This production was reported from twenty-four states. The first ten, namely, Pennsylvania, Indiana, California, New York, Missouri, Illinois, New Jersey, Michigan, Iowa and Kansas, given in the order of their importance, reported 69,682,321 bbl., or about 85 per cent of the total.

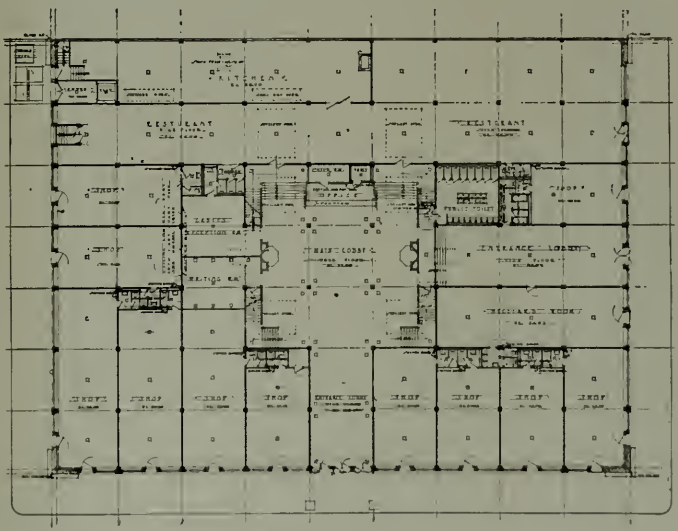
These states ranged in production from 20,441,338 bbl. in Pennsylvania, to 324,040 bbl. in Kansas. The first three reported over one-half of the total production.—Coal Age.

Workingmen's Hotel, San Diego

Messrs. Jno. D. and A. B. Spreckels, Owners *Harrison Albright, Architect*

Unique Workingmen's Hotel for San Diego

A FIREPROOF hotel for workingmen is being erected in San Diego by the J. D. and A. B. Spreckels Securities Company from plans prepared by Architect Harrison Albright of Los Angeles and San Diego. The project has been worked out on the lines of the philanthropic enterprises carried on for several years by the Vanderbilt and Mills families and Mr. Russell Sage in New York. It is not a charity scheme. While the proposed hotel will give the men employed in the extensive building operations of San Diego comfortable accommodations in a Class A building together with many of the conveniences of a high class hotel at a minimum cost, the project is expected to give both the owner and the men operating the hotel a fair return on their investments.



Ground Floor Plan, Workingmen's Hotel, San Diego

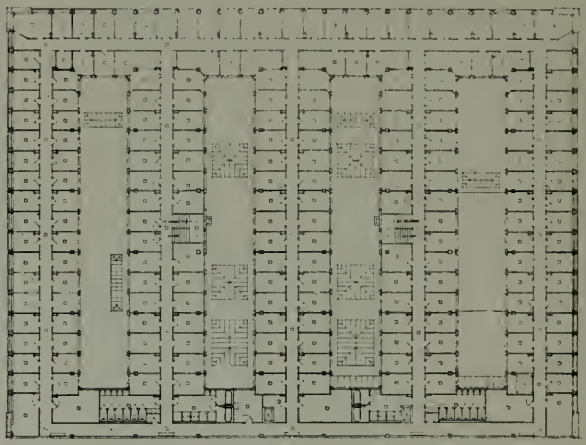
The new hotel will occupy about half a block on the north side of G street extending from Third to Fourth streets. It will be three stories in height with a basement containing room only for a heating plant. The ground dimensions are 200x150 feet. The design and plan insures a practical and at the same time an artistic solution of the problems involved. Reinforced concrete will be used in the construction of the building, the frame, walls, floors and roof slabs being of this material. The exterior of the building will be plastered with cement. Capping the piers at each corner of the structure on the facades will be groups of figures cast in cement.

On the ground floor there will be a large central lobby with broad entrance to the street, dining room, kitchen and store rooms. On the floors above there will be 400 bedrooms with public toilets and bathrooms. Nearly half the rooms will face on the three street fronts and the remainder will open

on three large light courts extending above the second floor. Commenting on the project Mr. Albright, the architect, said:

"Naturally the question arises how rooms can be rented at the low prices necessary to fill this building when rooms at 'The San Diego,' a new concrete hotel, cost from seven to twenty-one dollars a week. A comparison will show why. The San Diego is built on expensive land, has high-class elevator service, private bathrooms, large bedrooms, expensive carpets and furniture, refrigerating and ventilating systems, radiators, telephones in all rooms, electric lights wherever possible need for same may arise, a big roof garden and sun parlor, high grade hardwood finish everywhere and all the other luxuries which people will demand and pay for if they have the price; and all these things cost money.

"The new workingmen's hotel will be erected on land of moderate cost, yet close enough in to be an attractive location for those whom it is to serve.



Typical Floor Plan, Workingmen's Hotel, San Diego

It needs no elevators, has no private bathrooms, has bedrooms averaging only 8x12 feet, has inexpensive but comfortable and serviceable furniture, needs no refrigerating or ventilating systems, is heated by large radiators in the corridors only, has no room telephones, has one electric light in each room, its guests need no sun parlor, it is finished with Oregon pine, our own 'California mahogany.' In short, it will minister to all of a man's necessities and in addition will contain many features properly classed as luxuries.

"Some of its advantages over the prevalent type of cheap rooming house are that the building is fireproof, well lighted and ventilated, will be kept clean and sanitary. Each room will have wash basin with unlimited hot and cold water, heat enough will be provided to make the entire interior comfortable in winter. Large well-equipped toilet and bathrooms are provided on each floor, including both shower and tub baths. A large public lobby and a large restaurant are provided on the ground floor, with clean tiled floors and large plate glass windows opening to the street."

Bridges in Relation to the City Plan

By HENRY GRATTAN TYRRELL, C. E., Consulting Engineer.*

TWENTY thousand years ago or more, when some naked savages were out one morning in search of a dinosaur for breakfast, they came across a river, and, being unable to cross it, they fastened some logs together, and that was the first bridge. For countless ages, no better bridge than that was needed, because the wants of those native tribes were small and their tastes were unrefined. Quite as primitive and rude were their habitations, for little cared they for refinement or other things unknown to them, when their prevailing thought was the capture of a dinosaur to eat.

The change from that remote time to this is great, and yet the difference in conditions is a matter of degree, for the preservation of life by food and shelter is still the first law of nature. Mere habitations have developed into homes, both commodious and beautiful, while bridges and other public works have likewise improved, though not in proportion to the advance in art and learning.

The planning and proper development of cities, received, and indeed needed but little attention in the early days of the American republic when the population was rural. Our forefathers were most concerned with establishing colonies and extending a pioneer civilization from the first settlements on the Atlantic coast to the west, and it remains for us, their descendants, to as faithfully do the duties which lie before us, though of quite a different kind to theirs. Towns and cities are now established, and with population rapidly moving from the country to the cities, it behooves us to direct the city's growth according to proper plans, and perhaps to rebuild in certain places, so that ultimately, there may be some degree of beauty and completeness.

City planning is interesting at present, because, during the last few years, the subject has received more or less attention everywhere, and the subject has a special local interest now, on account of the National Convention on City Planning which recently assembled in Chicago. In connection with the development of city plans, bridges should receive special consideration, because they are such prominent and expensive public works. Many bridges are now under construction in our large cities, and more are in prospect, for all of which the people pay many millions of dollars.

Though comparatively new in America, city planning is old enough in Europe. Until recently, some of our largest centers have grown just like villages, increasing steadily in size, but improving very little in the character of their public works, the condition being a natural result of rapid growth. Bridges have been erected which were good enough at the time, but not suited to increased travel and heavier loads. The need for building to a plan is therefore evident. Buildings of all kinds are designed and carefully worked out, before construction is commenced, but the towns themselves have been allowed to grow haphazard, with structures of any form or height, ranged along in random order, plainly indicating no premeditation.

The difference between building with a plan and without one can be appreciated by comparing the great World's Fair of 1893—a little city in itself—with some scattered village on the frontier. The growth of large communities is too slow to fully comprehend, because the end cannot easily

*635 Michigan Ave., Evanston, Illinois. Prepared for the Architect and Engineer of California.

White Lick Bridge, Plainfield, Indiana

Showing Permanent Character of Roadway to Above Bridge

be seen from the beginning. It can better be realized by the contemplation of the World's Fair. At first the site was a rural park. Then the construction period began, and for months little evidence of order was visible, for everywhere was incompleted work, with building materials and rubbish piled around in bewildering confusion. But returning a few months later, what a transformation the visitor beholds: Chaos has been changed to cosmos, and the finished city is now a marvel of beauty, complete in all its parts. And though extending over a greater period, our great cities which are now in process of construction will some day be completed according to their plans, and will be the admiration and wonder of the world.

American cities may well be proud of their advancement, some of them being unequaled for their rapid growth anywhere in history. They are now not only the centers of commerce, but of culture and education. Their universities, colleges, museums and art galleries make them equal in some cases to Athens of old, and the very homes of education and art. Their city plans, which are now developing, will be unequaled anywhere, and their bridges should correspond. Those cities which are located on the coast or lakes have the charm of land and water scenery, so essential for landscape beauty, and some of those on the Great Lakes, through which the stream of western trade passes on its eastern course, are natural distributing and junction points, and must necessarily hold their commercial supremacy. In order to more fully appreciate the shore, it is only necessary to reside for a while in a prairie town where mountains and water are absent. The resident soon wearies for the water view again.

The shore is attractive not only from the tall buildings in the business section, but for many miles around in the districts of homes. When the vision has been confined all day to the limitations of the street or office, how restful is a glance out over the water, or in the evening how delightful to enjoy the lake and foliage in the shore suburbs. The wonderful plans which the Commercial Club Committee has developed for Chicago were possible only through the presence of the water, and there, the pleasure parks and beaches by the lake shore will soon be gardens of beauty excelling even its famous parks. Already containing a population of over 2,000,000, it must soon have twice that number of people, its future growth conforming with the city plan. Other cities have also produced fairs of wondrous beauty, each one benefiting by the previous ones. Trade and commerce must increase; it cannot diminish, and with increasing wealth we will some day see the fulfillment of the city plans, and we or our descendants will behold ideal communities, the culmination of our dreams. Shipping at some of the lake ports is now more than three times that of Paris, and it, too, must increase. Beautiful bridges over these busy inland harbors will therefore form an important part of the final plan, because they are so numerous.

What an influence for beauty these bridges can be made to have! Scattered through the cities, they will stand at almost every water crossing, either as an honor or a shame to their originators. From their very number, their influence must be great. Fortunate indeed is the city that has a valley or a river to be crossed, for such features are an opportunity for beauty. Level and uninteresting prairie towns would pay big premiums for such opportunties which they can never have, and yet, like many other blessings, they are too often unappreciated and neglected, when they might be turned to good account.

Bridge architecture, or the aesthetic treatment of these structures, has declined only within the last fifty years. Previous to that time, they were

equal in beauty to the adjoining building. Those of stone and cast iron, built in England and France during the first half of the nineteenth century, were aesthetically superior to ours of structural steel. We have, in fact, perfected bridges in their mechanical parts and made fine bridge machines certain and dependable in action, but usually void of adornment. Great benefit can be derived even now, by the contemplation of Roman works. Who would dare predict that any trace or vestige of our creations will remain in twenty centuries? And yet older works than that can still be seen, which have challenged time and storm since the dawn of the Christian era. One of these is the oft-quoted Pont du Gard, which was built in the fore part of the first century to convey water to the city of Nismes in France. For all succeeding centuries it has continued to be a model for aqueduct builders, as may be seen by reference to a recent one near Rome, and to our own High Bridge at New York, which, however, has only a single tier of arches. Pont du Gard, over the Garden river, is said to have been built during the reign of Emperor Augustus, under the immediate direction of Agrippa. Of its three stories, the lower one contains six arches, and the second story eleven arches above the lower ones, while the upper or third story has thirty-six small arch openings supporting the water duct. This old bridge has a wonderful history. More than one hundred and fifty years ago extensive repairs were made and the lower arches were widened to carry a roadway at one side. The lower arcade originally had four separate rings side by side and not bonded together, and the second tier had three similar rings. Repairs were also made in the fifth century after it had been partly destroyed by the barbarians. There is very little in the design of this ancient structure that could be reproduced at Chicago, but its aesthetic treatment was well considered by its builders.

Two other old and interesting bridges are those at Florence, Italy and Avignon, in France, built during the twelfth century. The bridge at Avignon is said to have been built by a religious order called "The Brothers of the Bridge," who made the building of bridges a religious duty. It was erected under the direction of Saint Benezet, who was once a shepherd boy. The money for its construction was raised by a pretended miracle, a policy which is still applied in some American cities. It was bowed up stream to better resist the pressure of the flood, and a chapel to Saint Nicholas stood on the third pier. Some of the arches were destroyed in 1385, and in 1410 a tower was blown up by the inhabitants of the adjoining town, carrying three spans down with it. Several more spans were washed out in 1670, but four arches still remain.

The absence of beauty in modern bridges is due largely to the influence of railway building, where the plainest and cheapest types were preferred because they could be most easily erected. More than 100,000 bridges of this kind were manufactured in recent years at the various bridge works in America. They were made at such a rate that time was not allowed even for making a plan or preparing a design. The much-talked-of Athbara bridge in Egypt, was made and erected by a Philadelphia company in less time than should have been spent in making the plans, and as a result, Egypt at this point is also disfigured with an ugly American bridge.

As the cost of these cheap and ugly truss bridges has become better known, the tendency has been to reduce the appropriations for new city bridges, which certainly should be finer than those out through the rural districts on the railroads. Truss bridges have, in fact, become the prototypes for others both in style and cost, and the excuse of insufficient funds for better

Reinforced Concrete Bridge, Middletown, California — *National Bridge Co., Engineers*

A Reinforced Concrete Flat Slab Bridge, Ross, Marin County, California

Maumee Bridge, Waterville, Ohio. Twelve Spans of 75 to 90 Feet Each

Concrete and Stone Bridge in Santa Clara County
J. G. McMillan, Engineer

Marsh Street Bridge, San Luis Obispo, California
Geo. Story, Engineer

work is too often heard. The absurdity of the excuse is evident, for our American cities, among the richest in the world, which can spend millions on theaters, luxury and display, and millions more on automobile indulgence, can well afford to beautify their public works, which can be used and appreciated by all, both rich and poor.

The prevalence of the competitive system in contracting, has also influenced against finer designs, because in receiving competitive designs and bids, municipal officers usually accept the lowest price, and consequently the plainest designs. Knowing this condition, designers have had little or no inducement to prepare fine plans which would only be set aside in preference to the cheaper ones. With no practice in artistic design, engineers have forgotten how to make them. The result is that the so-called engineers have continued their atrocious insults on trusting municipalities, and have caused the erection of unsightly angular frames standing out in gaunt relief against the sky, remaining as a very mockery to art. Not content with this disfigurement, the frames are often painted a glaring red, and then when the disfigurement is complete, the perpetrators have gloated over the insulted landscape like a band of conquering savages after a feast.

The question is sometimes asked, "Why should money be spent on beautifying bridges—are commodious ones not good enough?" The answer is that commodious ones are acceptable to just the same extent as a commodious depot or city hall would be acceptable. The business of the city hall or postoffice could doubtless be carried on in temporary wooden sheds, and yet millions are rightly spent on these monumental structures. What a travesty on art is the approach from the east to the new Northwestern depot in Chicago! The only artistic purpose served by the old bridge at Madison street, with its creaking and teatering draw, and nauseating odors from the floor, is to prepare the visitor by way of startling contrast, for the beautiful depot just beyond. Bridges of this kind, though doubtless very fine mechanically, are suitable only for rural districts or remote regions, and are quite inappropriate at the front door entrance to a commercial metropolis. Bridges like those at Madison and Washington streets, near the great railway depots, offer one of the finest opportunities for city adornment. They are beheld at once by visitors on emerging from the depots, and give the first impression of the city. A beautiful city should not be disfigured by homely bridges, especially in the most frequented parts. Right in the heart of the finest residential Back Bay district of Boston, adjoining the new depot, and only two blocks from Copley Square, stood an unsightly truss, which was the first object in sight as the visitor stepped out from the railroad station. It was at once a shock to all aesthetic sense, and an immediate disappointment to one who expected only beautiful sights in that residential district, the show section of the city.

The proper rule for the beautifying of public works is to adorn those structures most which are of the greatest public service. Investigation of the principle shows that similar rules are applied in business, for public officials who render the greatest service to the community are usually paid the best, and shown the greatest appreciation. With this rule as a guide, it will be seen that bridges which are absolutely indispensable, and constantly used by all, both rich and poor, are worthy of the best aesthetic treatment.

There are many other substantial reasons why bridges should be beautiful. The water scenery usually attracts people to a bridge especially in

summer, and the desire to promenade and loiter there is well known. In this respect they are similar to park structures and should be similarly treated. Bridges are easily made attractive, because of their setting with both land and water view, and because they are so easily adorned. For these reasons, the offense of neglecting them becomes all the greater. They should be made beautiful because they stand out so plainly above the water, where they cannot be hid. Their prominence and setting is naturally inviting, and beautiful buildings like the railway depots or the city hall should not be disfigured by ugly adjoining bridges, especially when attractive outlines can often be made to cost no more than ugly ones. Buildings can be shut in and hid by surrounding blocks, but not the bridges. There they stand, for better or for worse, out over the water where they can be inspected for several blocks in both directions.

The inconsistency of ugly bridges in otherwise attractive surroundings is analogous to that, common in some cities, of erecting tall buildings ten to twenty stories high, with beautiful fronts facing on the streets, but with sides and back walls coarsely plain, standing out in shocking contrast to the fronts, and sometimes even more conspicuous. In order to consistently carry out the city plan, public works should be equally adorned, the bridges being made to harmonize with the adjoining depot, city hall, or post office. The presence of fine bridges might easily raise the value of river property enough to pay for their construction, the condition being well illustrated by the Seine and Thames at Paris and London.

The time has fortunately come when great American cities will no longer tolerate the presence of ugly bridges in the streets, but will demand, in self respect, that these structures be made to conform with the wealth and dignity of the people. We have emerged from the prehistoric age of our antediluvian ancestors, and prefer that works of art should be usefully displayed, and not confined to galleries and museums.

The degree of civilization of any people is indicated by their public works. We judge the Greeks and Romans by what they built, and we know that they were great nations. We also know that the Indians who once inhabited America were content in their primitive civilization with a wigwam and a bridge of logs. So also, let the high civilization of the present day be manifest at our river crossings, as in our parks and on the boulevards.

Where I asked the question "What constitutes a beautiful bridge?" I might answer, "ask the city engineers, they know." The pity is that insufficient appropriations and other restrictions often prevent the carrying out of meritorious plans. When I was asked some time ago by private parties, to make designs for a bridge over the Chicago river at Rush street, I found that already there were beautiful plans in abundance, the execution of which have been delayed, and the old bridge is therefore still in use, allowing every once in a while an automobile full of people to plunge through the open draw into the river.

Bridges like other public works should be made to please not simply the artist, architect, or engineer, but all the people. Trusses above the roadway are an abomination and should be avoided wherever possible. They mar half the charm of the river prospect and are an obstruction to street travel and a positive danger in fire emergencies. This is more appreciated in Europe than here. The Tower Bridge at London with its clear span of 200 feet, has framing beneath the floor and not above it. The beautiful Alexander III bridge at Paris, crossing the Seine with a single span has no framing above the floor where the view should remain unobstructed, or

An Attractive Sacramento County Bridge

broken only by statuary or ornaments. The bridge of Saint Angelo at Rome built by Emperor Hadrian, is adorned at each side with statues of angels in white marble, a most appropriate setting for the entrance to the Hadrian tomb, or Castle of Saint Angelo.

It is impossible in the limitations of this paper to describe in detail all the opportunities for beautifying bridges, and it is enough to say that rules of aesthetic design have recently been established, which were formerly not generally known or understood, and that the application of these rules should produce good effects. (See Tyrrell's "Artistic Bridge Design," 1912). But it is needless to expect that monumental public works can be carried into execution on insufficient appropriation. When we build substantially as the Romans did, our works may then have promise of lasting for twenty centuries. Contracts then were given out conditional on the builders keeping their work in repair for a period of forty years, and the final payments were withheld until after the fortieth year.

In flat cities, impressive designs are not so easily made, for height is lacking, and yet the possibilities of fine results under these conditions are well illustrated at Berlin and at some of the cities in Holland. We cannot approve the wholesale condemnation of American bridges made by an eminent art critic in the east, when he declares that they contain but little that is beautiful, and yet, with larger appropriations, our bridges which are now almost perfect mechanically, could easily be made more attractive.

* * *

A Midnight Precaution

"John!" shouted the wife, in the middle of the night
John snored a bit louder, and turned over.
"John," she said, with increased emphasis.
"What is it?" grunted John.
"Get up. The gas is leaking!"
"Aw, put a pan under it and come back to bed!"

Entrance Hall Elevator Fronts, Kahn Department Store, Oakland
C. W. Dickey, Architect

The Steel and Iron Industry of California

III—The Monarch Iron Works

By FREDERICK JENNINGS

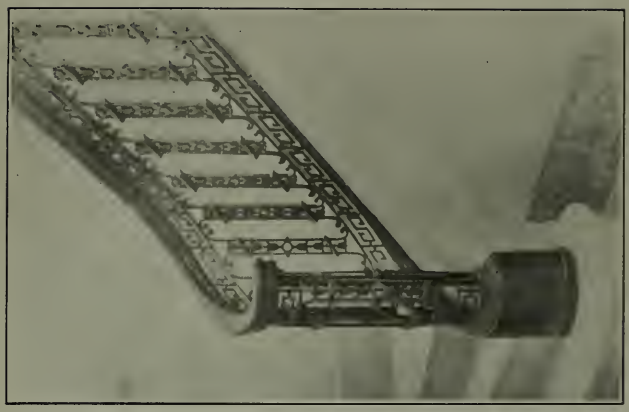
A BIG Eastern architect was "looking over" one of the recently completed bank buildings in San Francisco the other day. He came to the ornamental iron grill in the banking room, which he examined critically.

"Who did that?" he inquired of one of the bank officials.

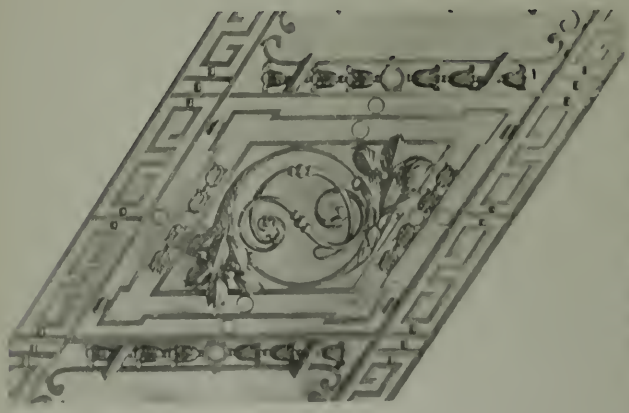
"Why, that was turned out by one of our local concerns," replied the banker. "We did not consider it anything extraordinary. I can get you the firm's name if you wish it."

"I most certainly do, for it is a beautiful piece of workmanship," said the architect, adding that he had no idea San Francisco ornamental iron firms possessed the facilities or the labor for turning out such splendid work. This little incident was one of many that happen very frequently, but which seldom get into print. It illustrates our point very well—that the California iron and steel industry maintains a standard of excellence second to none in the country—as good, if not better, than the foreign products. This is especially the case in hand-wrought work where some delicate pattern must be produced.

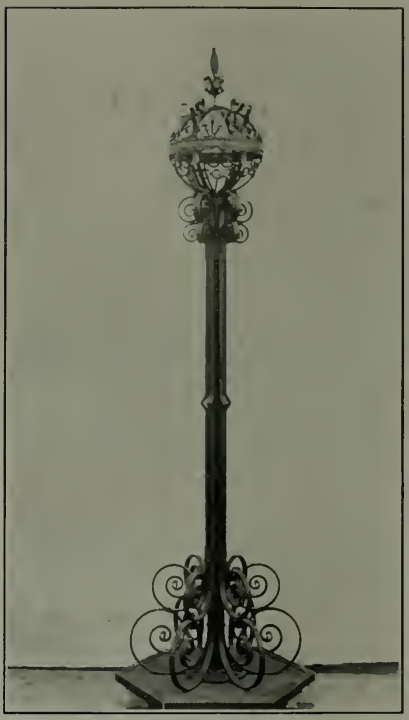
The illustrations accompanying this article are of recent work executed by the Monarch Iron Works, a comparatively new enterprise that has had remarkable success. The photograph of the entrance doors to the Farmers & Merchants National Bank in Oakland gives but a faint idea of the massiveness of these huge pieces of wrought iron. The doors are 14 feet high and seven feet wide and weigh more than 5,000 pounds. They were built of several hundred pieces of wrought iron that was afterwards



Ornamental Iron Staircase,
First National Bank, Sacramento
E. C. Hemmings, Architect



[illegible] Bank Building, Sacramento
E. C. Hemmings, Architect



Ornamental Iron Electrolier for Residence of Mr. Niels M. Alling

duplex copper plated. The doors were designed by Architect Charles Peter Weeks of San Francisco.

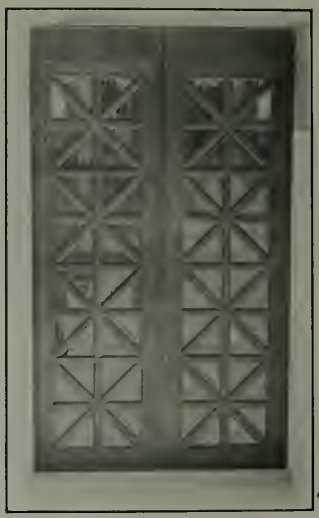
A particularly fine piece of hammered work is the staircase in the First National Bank Building at Sacramento, the design being centered about the monogram "S C" of the Sutter Club, which occupies a portion of the bank building. The leaves are made of hammered wrought iron, welded together into natural clusters, and then copper plated.

From a modest business of a few thousand dollars a year, the Monarch Company has grown until it now handles over $100,000 worth of work annually, and its original work shop, 25 by 50 feet, has been supplanted by a modern factory, 60 by 100 feet, and two stories high, with a yard space equal to the shop footage. Much of the machinery has been built on the site, new contrivances being made as the requirements of the business demand. The mechanical department is in charge of Mr. N. M. Alling, M. E., who for years was identified with some of the leading ornamental iron and bronze concerns of the East. The outside end of the business is looked after by Mr. H. Hallensleben, C. E.

Ornamental Iron Stair Railing, Entrance to Concordia Club, San Francisco. G. A. Lansburgh, Architect

Entrance Gate, Children's Day Home, San Francisco
Willis, Polk & Co., Architects

Some of the work, not already enumerated, which this company has executed since entering the ornamental iron field in 1908, includes the Kahn department store building in Oakland, C. W. Dickey, architect; the Pantages theater in the same city, O'Brien & Werner, architects; the Stocker & Holland building, Oakland, Frederick H. Meyer, architect; the Pacific Gas & Electric station in Sacramento, Willis, Polk & Co., architects; the Pacific Gas & Electric building, Sacramento, C. E. Hemmings, architect; the Nicholas building, Sacramento, C. W. Dickey, architect; El Dorado court house, Placerville, Cuff & Diggs, architects; the Y. M. C. A. and the Hall of Justice in San Jose, Wm. Binder, architect; and the Agnew State Hospital.



Bronze Doors to Farmers & Merchants National Bank, Oakland
Charles Peter Weeks, Architect

In San Francisco contracts have been satisfactorily completed on the following buildings: Lurline Baths, Adler Sanatorium, Holbrook building, Macdonald & Applegarth, architects; Whitney building, Mr. McLennon, manager; McKinley and Hancock schools, etc.

At present the company is working on the Polytechnic High School, a large contract, with over 180,000 pounds of cast iron going into the stair work alone.

* * *

"The time will come," thundered the suffragette orator, "when woman will get a man's wages!"

"Yes," sadly muttered a man in the rear seat; "next Saturday night."

Waste in Bidding

The two articles that have recently appeared in this magazine dealing with the present unsatisfactory and highly expensive method of figuring construction work, have attracted wide interest and not a little serious comment. In line with these articles the following from Cottrell's Magazine is most interesting:

MOST of our economic waste is due to a lack of a definite knowledge of costs in our industries.

For instance: You have a building project and you call in seven or eight contractors all of the same general class to submit proposals on the work. There will be a difference of 30 per cent between the highest and lowest proposal, and all of which means that costs in this industry are largely a matter of opinion.

With costs only as a matter of opinion, the building public has no confidence that one man's judgment represents the lowest market price, so a group is called in to spend their time and money in making an estimate, and with no reward—only the hope of reward.

All this is wasted effort with them all, save the successful bidder.

Very few people realize what it costs to make estimates on building projects, even though the basis of an estimate is not a matter of definite knowledge.

Take a court house or city hall, say one costing five million dollars, exclusive of the heating, plumbing and decorations.

It will cost each general contractor who submits a proposal $5000 in traveling expenses and the labor of estimators.

Say there are eight contractors figuring on the work. This means that through a lack of confidence, which has been created in the public mind by a lack of definite knowledge, a debt of $40,000 has been accumulated, which society, somewhere, somehow, must pay.

With smaller building projects the cost of making estimates is very much higher in percentage, double in some cases, and when we consider all the estimating of all the building of the United States in a year, the amount expended in both money and effort, in order that the owner may know the lowest market price, is a gigantic total and a frightful economic waste.

It has only been within the last few years that there has been any organized effort among building contractors to determine absolutely costs in the detailed operations of building, and with the same certainty and accuracy that the typewriter, adding machine, automobile, and low-price watch manufacturers know their detailed costs.

This organized effort for cost finding has only been with the very large contracting organizations, and is of little value because they have the unfair competition of those who do not know their costs.

The average contractor in the average city has no definite knowledge of the cost of a cubic foot of brick work, a square of floor, a yard of plastering or the average cost of putting on inside trim, fitting such and hanging doors.

The average knowledge of building costs is inherited—the present generation got their present basis of prices from their fathers or their former employers under whom they learned their trade.

These prices have been increased in percentages from time to time as material and labor prices have increased, but no doubt the original basis of them was wrong.

The average contractor's bookkeeping, together with his cost keeping, is so indefinite that he does not know until a contract is completed or until the end of the year, or until he goes out of business, or dies, whether he has made any money or not.

He may make money on one operation and lose it on another, or on one contract and lose it on another; he gets too much for one operation or one contract and not enough for another.

Then comes the moral effect of a lack of definite knowledge of costs.

The shrewd owner finds that costs are a matter of opinion, and he at once undertakes to change that opinion by applying horse-buyer methods in order to get his building as cheap as possible; the contractor in turn takes this as a moral license to "trim" the owner at every point, even to the extent of slighting the work.

The owner comes back with bonds, forfeitures and iron-clad contracts, all of which are childish, for no one can make a man do good work if he hasn't the free will with a profit as an incentive to good work.

The building contractor has not made money in the same sense as other industries involving the same skill, responsibility and capital.

The solution of this evil is in very simple local organizations of contractors, not to control prices, but for the purpose of educating each other to costs.

Price will take care of itself naturally if each knows his cost; for it isn't natural for a man to sell less than cost if he knows it.

The printing industry of this country was up against the same problem as the building contractor until a very few years ago. They tried all sorts of organizations for years, but their final success was in organizations to educate costs.

In every large community the printers have an organization, on the plan of a social club, except that the principal committee is known as the cost committee, which collects data as to costs locally, nationally and even internationally. These local organizations naturally form themselves into national organizations, that employ cost-finding experts even from outside industries, and this knowledge becomes accessible to all members.

It is simply a case of the strong educating the weak in order to keep the weak from becoming unfair competition.

As a result, there is a normal profit on every printing contract rather than one buyer paying too much and another not enough.

With a definite knowledge of costs the printer has the moral courage to say "no" to the horse-trader buyer.

This editorial is simply using the building industry as an illustration of a condition which will prevail in any industry or any service to society where the cost of rendering the service is not known.

It will not apply to the farmer, the storekeeper, the banker or even the professional man.

It is just the difference between knowledge and ignorance, efficiency and obstruction.

* * *

Try This on Your Floor Mat

Teacher—Bobby, give me an example of the word "damper."

Bobby (after a moment's thought)—Paw says maw is too damperticular about his feet bein' wiped.—Boston Transcript.

The Quantity System of Estimating

EDITOR, The Architect and Engineer:—The article which appeared in your last issue advocating the adoption of the quantity system of estimating was of interest, and in a sense commendable, notwithstanding that it contained at least one statement regarding a fundamental principle which no one having experience with this system could pass over without mental or open criticism, a statement which, if not corrected, is liable to confuse those of your readers who are familiar with the quantity estimating doctrines that I have been advocating now for over twenty years.

On page 107 of said issue appears the following, viz: "that is, The Architect and Engineer shall issue with his drawings and specifications a survey, or bill of quantities, etc." Now, my personal opinion, borne out by practical experience, is, that the less the architect or the engineer has to do with the issuing of quantities the better, whilst acting for the owner. It is no part of any architect's duty to prepare quantities for a contractor's use, to say nothing of the more than probable result, viz: that such work would be relegated to subordinates having little or no special training in such important matters. What self-respecting contractor, may I ask, would use quantities prepared under such conditions?

If, however, any architect, with an eye on the quantity surveyor's fee, should, nevertheless, and for a consideration, supply contractors with quantities for the buildings he also designs, his position would be, to say the least, embarrassing and unenviable, and certainly not conducive to those higher professional ideals which prevail among the best type of architects. Apart from that, it would seem that the familiar words would apply, "no man can serve two masters," and we may safely add, especially when the money interests of the two do not run in exactly the same direction. A few weeks ago my attention was called to an article published in an Eastern architectural magazine, which stated plainly that the adoption of the quantity system would mean reorganizing the architect's office. To me it was sad and depressing to read such a misstatement, and doubtless a disappointment to those who, like myself, have had some experience with the quantity system, and it must have occasioned surprise in the minds of those architects who are sincerely helping this work, and hoping to see better methods adopted.

However, nothing can be farther from the real facts than such statements, for in place of adding to the burdens and ever-increasing responsibility of the architect, the quantity system in full operation relieves the architect's office of a mass of detail work which does not, and never did, properly belong there. Such inaccurate information, although I believe unconsciously given, nevertheless injures a worthy cause like this, for the quantity system will do more to bring about confidence and better work than any other one thing I know of. Personally, I believe the time is not far distant when the best contractors will decline to any longer give "free bids" for buildings, which may or may not ever be built, unless accurate quantities are furnished for their use, and to form the basis of the contract. The present method is too one-sided altogether. It is a condition which every Architectural Society and every Builders' Exchange in the country should take under immediate consideration.

G. ALEXANDER WRIGHT, Architect.

571 California Street, San Francisco, Cal.

The Development of the Fireplace*

By B. H. SMITH

JUST how the world got on without fireplaces as long as it did is hard for twentieth century folk to figure. But in the oldest castles, manor houses and monasteries of Europe there were no fireplaces such as we know. For the first thousand years or so of this era men were too busy fighting to have much time to spend at home, and the homes of early kings and nobles were rather fortresses than houses. The principal feature of these was a great hall where a king or noble and his retainers celebrated a victory with much feasting and drinking, or retired to nurse the wounds of a defeat.

How to keep warm in one of those great, lofty, flag-paved halls would present a problem at any stage of the heating game, and their owners solved it in the simplest, most primitive way. They wore heavy clothes, drank lots of ale, and built a huge fire on the floor in the center of the hall, at which they

Kitchen of Glastonbury Abbey

could warm one side at a time while awake, and their toes when they went to bed on the flags. The smoke from the fire curled over their heads and found its way out through a hole in the room called a louvre.

The cooking was done about this fire, and after the feast the retainers slept on the floor of the hall, while the lord and master slept in a small room opening off one end. Later there were separate kitchens, and though the fireplace was no more than a shallow pit in the floor or a slightly raised hearth, and the chimney a hole in the roof, right royal feasts were made over them, of boars and bucks and sheep and cattle, roasted whole and served with many a leathern blackjack of ale to wash it down. A kitchen of this type is the one remaining feature of Glastonbury Abbey in England, which dates back to the twelfth century. The building was neither more nor less than a huge stone chimney, with a couple of doors and a few windows. In it were four huge fireplaces, not recessed, as our sense of the word implies, but merely places

*From Radiation, published by United States Radiator Corporation.

Built on a Projecting Hearth With a Hood

where fire was built, around which cooking was done for the monks, the smoke and fumes rising skyward through holes in the peak of the octagonal roof.

The nearest approach in early Norman days to a fireplace of our sort was one against the wall, but instead of having a recess for firelogs and back there was merely a slope backward from the base, and against this slope logs were probably placed on end. Chimneys were not common even in the finest houses until the fifteenth century. They seemed to have been first built in the solar, or upper chamber assigned to women in feudal days.

When fires first left the centre of the great halls and took to one of the walls, they were built on a low, projecting hearth. Over this hearth was a hood resting on brackets or columns which directed the smoke upward. Where the slanting roof of the hood merged into the wall, the flue sometimes went straight through to the outer side of wall. This fashion never became general, and very soon the flue crept straight up the inner wall to the roof, where it was capped by a spire or other ornamental feature. Sometimes this flue retained the hood shape all the way to the roof, but again it was built in more rectangular form.

By the Fifteenth century there was less need of fighting. Men cared less to wander from their own firesides, and began to care more about what those firesides were like. There followed such a building boom throughout Europe as has never since been known. Millions of money and more millions of men were spent in building what are even yet marvels and models in architecture. As life, to the few at least, became a more com-

When the Flue Crept Up the Inner Wall

One of the Oldest Mantelpieces in France, in the Chateau Blois

fortable and more private affair, living rooms increased in number, and scarcely a room was without its fireplace. The old fortresses were remodeled, and in their thick walls was ample space for both hearth and flue to be built, roomy enough for sections of whole trunks of trees, with plenty of wall beyond.

At first the fireplaces were simple, with arch flush with the wall and a small mantel above, sometimes plain, sometimes slightly carved. The chief subject for decoration was the heraldic device of the owner. As the Gothic style evolved and merged into the Renaissance, more and more attention was given to mantelpieces, until they and bedsteads vied with each other for first place in interior decoration, and were to the interior what the entrance was to the exterior. Fire-dogs and fire-backs were elaborately wrought, to keep pace with the mantelpieces. Some of the earliest dogs had at the top a cup-holder, which could be raised and lowered, and was evidently intended for mulled ale.

The materials used in mantelpieces varied with the locality. Perhaps the finest work of the middle centuries in England was done in wood, which progressed from simple paneling to elaborate carving. Hard chalk and stone were also used in regions where they were more plentiful than oak forests and in very great houses there was carved marble, largely under the influence of Italian workmen who came with their Renaissance ideas and their facility for work-

Fifteenth Century Fireplace of Francis I, in Chateau Blois

ing in marble when Henry VIII and Elizabeth stretched forth a welcoming hand to foreigners.

In France wood was perhaps less used than marble and stucco, while in Italy marble was more common than any other material. Germany confined itself very closely to porcelain stoves, though in some of the old castles there are simple forms of open fireplaces. Holland was famous for its tile, for both stoves and fireplaces.

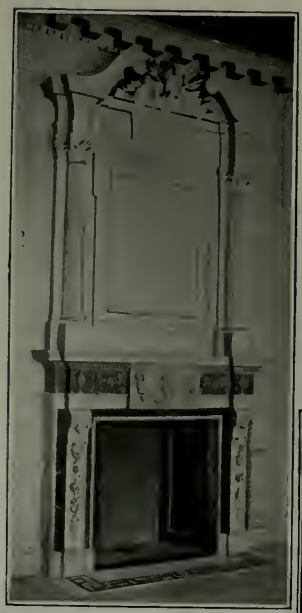
In France, as in England, the commonest scheme of decoration was the use of the coats of arms, and one of the oldest mantelpieces to be seen there is in the Chateau Blois, famous as a favorite residence of the diabolical Catherine de Medici during her long reign of terror in France. It was built about the Fifteenth century, probably by Louis XII, as it bears in one

Fireplace in Washington's Home at Mount Vernon

Both Hearth and Flue Found Ample Space in the Thick Walls of the Great Hall

panel the porcupine of the house of Orleans, and in the other the ermine of his queen, Anne of Brittany, and their initials, Francis I, who succeeded this king and was a great patron of Italian art, built a new wing to the chateau with mantelpieces much more ornate if less beautiful in proportion. One of the finest bears his device, the salamander, which, together with his motto, "I nourish the good and extinguish the evil," was very appropriate for a fireplace.

A visit to the mediæval manor houses and chateaux is like digging around the roots of a family tree. These old fireplaces and chimney-pieces are the grand-daddies of our modern ones. After them many

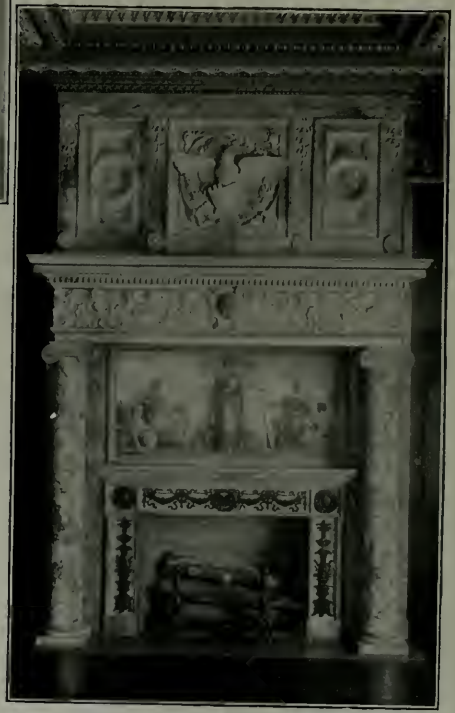


Mantelpiece in an American Country Home, a direct descendant of the French Renaissance

are today being fashioned, with such changes and improvements in interior construction as conditions require and inventive genius can contrive. There is no longer need of a roomy chamber for the chimney sweep, nor for the heavy beam which braced the chimney in many ancient fireplaces, and proved fatal to many a great mansion in remote regions with no fire protection. When one thinks what these mediæval monuments have been through, it is surprising that anything is left to tell the tale of their former glory. During the French Revolution the mobs vented their rage against their rulers by destroying as much of their costly work as possible; and during the revolution of taste to different centuries finely carved stone chimney-pieces have been carefully painted and grained to imitate wood, and others torn out and replaced with some fad of the moment.

In the early days of our own country, of necessity the pioneers went back to first principles. Fireplaces were ample in size and modest in decoration. How ample may be seen by the various adjuncts to a colonial fireplace—spits and big dogs, and kettles of all sorts and sizes swinging from the pot-hooks and hangers—some even having a seat inside them. How simple, may be seen in the few houses still standing that date back to colonial days.

Naturally, in early days the fireplaces showed the influence of the various mother countries. In the Dutch settlements tile was used about the opening. In English settlements a broad beam took the place of an arch, and in the South,



In the House Reading Room of the Congressional Library at Washington

Not a Monorch in Silk Stockings, but a Monarch None the Less

where there were many English proprietors of means and refined taste, the decorations though simple, were remarkable for delicacy and grace. Some were of delicately carved wood, others of cement composition decorated in low relief, and others of marble. Almost without exception they were white, with gold leaf on the relieved portions.

With the stove era fireplaces went out of fashion. A few houses had mock fireplaces where no fire was ever built and showy mantelpieces as ugly as everything else about most American houses until within the past decade or two. About the only genuine thing in the way of a native American fireplace was that built in some Western prospector's cabin or mountain inn. After stoves the introduction of central heating made the open fireplace still more unnecessary, and oddly enough the self-same thing has made possible the recent revival. Now, as never before, the fireplace can be considered from the æsthetic rather than the practical view-point, and there are no two opinions as to the charm of the open fireplace. There is something so cheerful and inviting about it something so companionable in the glow of the coals and crackling of wood, something so conducive to contentment and to dreaming, that no home is complete without at least one. And since one need no longer depend upon the open fireplace for warmth in large rooms, it can fulfill its perfect mission—that of beauty and good cheer. To

Does Not Disdain Its Humble American Origin

be sure, more than a hundred years ago Count Rumford invented a fireplace that he pledged his word, and proved, would heat comfortably rooms of more than ordinary size, but there are restrictions in the dimensions of the opening that detract from the charm of Rumford fireplaces.

A Modern Mantelpiece of Dutch Design

The fireplaces of today may be traced to a varying ancestry. Just as all good democrats like to think themselves of aristocratic origin, so as many as possible fashion their fireplaces after those of mediæval palaces. In the House reading-room in the Congressional Library at Washington, we, the people, have blazoned our royal device in the center of a massive chimney-piece; and in private homes as well as public buildings there are mantelpieces that rival in splendor those built by the order of princes.

Obviously, however, elaborate chimney-pieces are not suited to bungalows and other small houses, and in these modester homes, in country clubs and mountain inns, are found the descendants of some humble cottager of Old England with heavy beam and cozy settle; some quaint Dutch burgher with pictured tiles; some half savage Norman with lowered hood; and there are those who do not disdain the humble American origin of the western pioneer, built of stones picturesquely piled at the end of a cabin. Indeed this typical American fireplace and chimney of irregular cobbles has attained a great popularity, and

A Modern Fireplace Suitable for a Home of Almost Any Size

Artificial Caen Stone Mantelpiece in Country Residence of Mrs. J. H. Spring, Thousand Oaks, Berkeley, Cal., by Sarsi Studios

it should encourage architects to seek close at hand for inspiration, both in the matter of material and its use. Since fireplaces no longer have rivals in the form of carved bedsteads, as in the olden days, they stand supreme as the conspicuous feature of the interior of a house, and to have them harmonious and satisfying is worth all the thought and effort that may be spent on them.

* * *

Parasite-Infested Architecture

THREE distinct parasites fasten on our city buildings, confusing their scale, cluttering their base lines, masking their decorations, disheartening in advance the conscientious architect, comments the Boston Herald. The first is the lettered signboard, made not merely to be seen, but to catch and hold the glance. In some form, the sign is a necessary evil. But could it not be reckoned with more boldly by the architects, both in designing elevations and in advising clients after occupation? Some day merchants will come to see that beauty in wares for sale, and in the window schemes for their display, calls also for a framing beauty in the whole store front.

The second parasite is the creeping vine. Some buildings deserve it; season by season they need the close mantle of rippling green or the clinging veil of netted runner and tendril. The coarser and heavier the building, the greater its need for some such figured covering. But other buildings, clean cut and pleasantly proportioned, telling a structural story in lines well carried through, or taking the eye with finely wrought texture and detail—these have no need for a kindly covering of blemish and defect; they have a right to be seen bare and in their full design.

The last of the three parasites is neither a necessary evil nor an occasionally pleasing mask; it is an abuse, tolerated only for a trifling convenience and for the dollars it brings in—it is the vendor's booth, lodged in any available nook or corner of any building that the crowd passes. The stands of these petty traffickers in postcards, peanuts and penny candies no more regard the walls they huddle up against than the nests of the plastering mud-wasps regard the carving on the temples of old Egypt.

* * *

Two Ways to Skin a Rabbit

Individual contractors and contracting firms in Seattle, who, up to a year ago, when the minimum wage ordinance passed, have done practically all of the local improvement work in Seattle, will be driven out of business, in the opinion of Superintendent of Streets Charles R. Case, by the combination of Italian laborers who have been submitting bids for various improvements within a year.

This opinion was given to the Board of Public Works when Case reported on one of these Italian firms, N. Florito Bros. & Sauro, the low bidders for sewers in the Ashworth avenue district. Case found the firm to be composed of five Italians, one a citizen and the other four having declared their intentions to become citizens. The sewer contract was awarded to this firm at about $5,000, and the work will be done in its entirety by the five members of the firm, who thus evade the minimum wage, dividing any profits in five parts.

Case says it will soon be impossible, because of these combinations, many of them containing enough members to carry on much larger improvements for contractors or contracting firms to pay the minimum wage of $2.75 and compete with firms that figure profits and wages together and employ no labor.

* * *

One on the House

THE literary young woman entered an editor's office in a Western town.

"I have written a poem," she began.

"Well!" exclaimed the editor, with a look and tone severe enough to annihilate; but she wouldn't annihilate worth a cent. It was the psychological moment for her and she resumed:

"I have written a poem on 'My Mother's House,' and——"

"Oh!" interrupted the editor with extraordinary suavity. "You don't know how relieved I am. A poem on your mother's house, eh? I was afraid it was written on paper and that you wanted me to publish it. If I should ever happen to pass your mother's house I'll stop and read the poem."—National Monthly.

* * *

No Chance for "Extras" Here

"Ive got a good joke on the contractor who is going to build my house."

"What is it?"

"The contract calls for a five-thousand-dollar house."

"Well?"

"He'll have to build it for that."

"Why?"

"That's all I've got."—Detroit Free Press.

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Next Convention City—Seattle

Awarded Platt Scholarship

Robert D Murray, 2665 Orchard Ave., Los Angeles, and a graduate of the Los Angeles Polytechnic High school, has been awarded the Howard H Platt scholarship in the college of architecture of the University of Pennsylvania. Murray is twenty years of age and graduated last year with a high record. He is employed as a draughtsman in the architectural department of the board of education.

WORK IN ARCHITECTS' OFFICES

SAN FRANCISCO AND BAY CITIES

FRED B. WOOD, 2211 Steiner street, has completed plans and work has just been started on a three-story frame and brick veneer apartment house, on the west side of Larkin street, San Francisco, for F. M. Greenwood. There will be 15 apartments with all modern conveniences.

CHARLES E. J. ROGERS, 24 California street, has let a contract to Ward & Goodwin for the erection of a three-story and basement brick rooming house on the south side of Golden Gate avenue east of Hyde street for about $20,000.

REID BROS., California Pacific Building, have practically completed plans for the Spreckels Building to be erected at Fourth and Market streets. Work will be started as soon after the first of the year as possible. This building will contain over 500 offices and will be Class A construction.

The same architects are preparing plans for a Class C store and apartment house to be erected at Post and Fillmore streets for the Peninsula Realty Company. The same architects have let contracts for the new First Congregational Church which is to cost in the neighborhood of $200,000.

J. C. HLADIK, 825 Monadnock Building, has let contracts for a three-story frame and plaster apartment house at Ellis street and Farren avenue, San Francisco for D. Harris.

The same architect has completed plans for another apartment house of three stories and also for a three-story frame laundry building for D. Edwards & Son.

ALBERT FARR, Foxcroft Building, is completing plans for a two-story and basement frame and plaster residence to be erected in West Clay Park, San Francisco, for George C. Sargeant, 901 Mechanics Institute Building. The cost will be about $10,000.

MacDONALD & MacDONALD, Holbrook Building, have let contracts for a five-story and basement reinforced concrete hotel to be erected on the north side of Mission street between Fourth and Fifth, San Francisco for H. Baker Fisher of Hale Bros. The building will cost about $50,000.

The same architects have prepared plans for a substantial addition to the Union Square Hotel at Post and Stockton streets. The personnel of this firm is composed of Kenneth MacDonald, Jr., and his father, the latter having been a practicing architect in the East.

HERMAN BARTH, 12 Geary street, has completed plans for a Class C automobile sales building, to be erected on the southeast corner of Van Ness avenue and Pacific street for Dr. Martin Krotoszyner and which will cost about $16,000.

The same architect has just completed the construction of a three-story reinforced concrete automobile sales building, on Van Ness avenue near Post street. The building is of very attractive design.

FREDERICK H. MEYER, Bankers' Investment Building, is preparing plans for an addition to the printing plant of the Rincon Publishing Company. Mr. Meyer also has two large apartment houses and a physicians building on the boards.

WILLIAM L. WOOLLETT, Newhall Building, has made drawings for four safety stations for the city of Berkeley. They will be of concrete, stone and marble, and will require an expenditure of about $20,000.

SHEA & LOFQUIST, Bank of Italy Building, are preparing working drawings for a four-story and basement Class C store and hotel building, to be erected on Ellis street near Polk, for the Kennedy estate. The estimated cost is $40,000.

ARTHUR G. SCHOLZ, Phelan Building, has recently let contracts for a three-story and basement frame apartment house, to be erected on Fulton street east of Gough, for Carl Mertens of 3962 Army street, San Francisco. The estimated cost is $12,000.

JOHN HUDSON THOMAS, First National Bank Building, Berkeley, is completing drawings for a two-story and basement frame and plaster residence and garage to be erected at Cragmont, Berkeley, for Mrs. H. C. Newman of Petaluma.

EDWARD C. FOULKES, Crocker Building, has completed drawings for a four-story and basement Class C apartment house to be erected on Bush street near Grant avenue for Mrs. A. Rudgear.

The same architect has let contracts for the construction of a handsome residence in Fresno for State Senator W. A. Sutherland.

B. R. CHRISTENSEN, 406 Grant Building, has completed plans for a four-story store and hotel building to be erected at Broadway and Grant avenue, San Francisco, for Mrs. Mary Marsicano of 781 Green street, San Francisco. The building will be of reinforced concrete and will contain 200 rooms. The estimated cost is $120,000.

HENRY C. SMITH, Humboldt Bank Building, is preparing plans for a two-story and basement reinforced concrete high school building to be erected at Suisun at a cost of $80,000. Mr. Smith has also made plans for extensive alterations to the Presidio Terrace residence of Herbert C. Porter, an attorney in the Call Building.

MILTON LICHTENSTEIN, 111 Ellis street, is taking figures for the construction of a three-story and basement frame and plaster apartment house to be erected in the Mission District and to cost about $35,000. There will be thirty-two apartments of two rooms each.

PHILIP OVERMAN, Shreve Building, has completed plans and will shortly award contracts for a four-story and basement reinforced concrete warehouse at Jessie and Ecker streets, San Francisco, for William H. Crocker. The estimated cost is $40,000.

ROUSSEAU & ROUSSEAU, 441 Monadnock Building, have completed plans for a four-story and basement Class C apartment house to be erected on the southeast corner of Pine and Leavenworth streets, San Francisco, for Theodore E. Ruffs, of 1175 Pine street. Building will be of brick and will cost about $40,000. There will be 17 apartments.

WARD & BLOHME, Alaska Commercial Building, have completed drawings for a two-story and basement, frame and plaster house to be erected on the west side of Delong avenue near Frederick street, San Francisco, for Roy C. Burling of 112 Delmar street, San Francisco.

JULIUS KRAFFT & SON, Phelan Building, have let contracts for the construction of a two-story and basement reinforced concrete store and loft building, to be erected on the southwest corner of East and Pacific streets, San Francisco for A. J. Donzel.

WILLIAM A. NEWMAN, Hewes Building, is preparing plans for a one-story frame and plaster parish house, to be erected at Shafter and College avenue for the Olivet Congregational Church.

The same architect has completed plans for a two-story frame and plaster residence, to be built at Rock Ridge, Oakland, for A. K. Harford and to cost about $5000.

PHILIP SCHWERDT AND COMPANY, Phelan Building, has been commissioned to prepare plans for two State Buildings to be erected on the Panama Pacific Exposition grounds. One is for the Republic of Honduras and the other for Guatemala. They will cost about $20,000 each.

WILLIAM MOOSER, Nevada Bank Building, has completed plans for a four-story addition to the Hotel Larne at Ellis and Mason streets. Construction will be Class C and will give the hotel 63 additional rooms and 60 baths. The estimated cost is $60,000 and with the added floors the building will be seven stories high.

WILLIAM H. WEEKS, 75 Post street, is preparing plans for alterations to the interior of the First National Bank of Bakersfield. Mr. Weeks also has plans under way for extensive alterations to the residence of A. J. Raburn, at Pacific Grove.

The same architect has completed plans for the new Orland School to cost about $40,000.

W. J. WYTHE, Central Bank Building, Oakland, is preparing plans for a two-story and basement frame and plaster residence, to be erected at Ingleside Terrace, San Francisco, for his brother, Attorney Frederick S. Wythe of San Francisco. The house will cost about $6500. The same architect is preparing plans for a three-story frame and plaster Methodist Denominational Building to be erected in San Francisco.

Contractor Who Built Ferry Building, Dead

Charles F. McCarthy, president and executive head of the Pacific Construction Company of San Francisco, died at his home in Alameda in July. McCarthy was one of the best known construction men on the Coast. His firm built the Ferry building in San Francisco, the Madison street bridge over the Willamette river, in Portland, and the great La Grange dam for the Modesto and Turlock irrigation systems. He built courthouses in Madera, Contra Costa, Tuolumne and Nevada counties and built the jails in Martinez, Oakland, Fresno, Eureka and Modesto.

McCarthy was born in California and was 53 years of age. His home was in San Francisco until nineteen years ago, when he moved to Alameda. He is survived by a widow and five children.

Much Government Work Planned

Plans will soon be started in the office of the Constructing Quartermaster at Fort Mason, for a large amount of construction work to be undertaken at the various posts about San Francisco Bay.

The following appropriations for the fiscal year 1914 have been made:

Seven new buildings at Presidio, $91,000.

Two new buildings at Fort Mason, $140,000.

Five new buildings at Fort Winfield Scott, $134,000.

Road Construction at Presidio, $50,000.

Road Construction at Fort Winfield Scott, $30,000.

Sewer construction at Fort Winfield Scott, $20,000.

Retaining wall at Fort Miley, $20,000.

A Dwelling of Unusual Construction

A dwelling house involving some rather unique features of construction is under way on the ranch of Mr. A. K. Macomber, near Hollister, Cal. The house is in the Moorish style of architecture, designed by Wolfe & Wolfe of San Jose, and a feature will be a patio in the center with a concrete swimming pool, 52 x 72 ft. in size. The house covers a ground area of 124 x 116 feet, and 18 of the rooms will be finished in white cedar and birch. One of the most striking features of this residence, which will be of frame with stucco finish, will be an arch roof of Roman bronze screening supported by five steel girders.

Vancouver Architects' Chapter

Including their first annual exhibition of architectural drawings, and an interesting paper by W. T. Whiteway, of Vancouver, on "Architecture, Ancient and Modern," the second annual meeting of the British Columbia Society of Architects was featured by the election of the following officers:

President, Mr. Hoult Horton, Victoria; vice-president, Mr. J. L. Putnam, Vancouver; secretary, Mr. N. E. Read, Victoria; treasurer, Mr. P. L. James, Victoria; executive council, Messrs. Horel, Dodd, Hope, Thompson, Birkenhead (of Vancouver), Messrs. Cullen, Wilson, Jameson, R. Wilson and Keith (of Victoria).

New State Architect

George B. McDougall, the junior member of the architectural firm of McDougall Brothers of San Francisco, has been appointed State Architect to succeed John W. Woollett, resigned.

In accepting Woollett's resignation, State Engineer W. F. McClure declared Woollett an efficient man with ample energy, but said he did not seem to fit with California conditions. Woollett is a graduate of the Massachusetts Institute of Technology.

Polk Still Abroad

Architect Willis Polk and Mrs. Polk, who have been visiting Arthur Rose Vincent at Muckross Abbey, Ireland, are at present in London. During his stay with the Vincents, Polk made a number of plans for restoring the famous old castle, one of the historic landmarks in Ireland. William Bourn and Mrs. Bourn of Hillsborough are guests at the Abbey and will remain with their daughter, Mrs. Vincent, for some time.

New Officers of Architectural Club

At the regular monthly meeting of the San Francisco Architectural Club, the new treasurer, Wm. D. Sherman, and directors, Jas. Magee and George E. Greenwood, were elected to their respective offices for the year ending July, 1914.

New Architects

The Southern California State Board of Architecture has granted certificates to practice architecture to the following: E. L. Hopkins, 616 Delta building; Charles F. Garstang, 720 Black building; Thorgils Thorsen, 321 South Olive street all in Los Angeles, and John M. Cooper, Long Beach.

Lansburgh One of Library Competitors

Willis Polk has withdrawn from the San Francisco Library competition and his place has been filled by Architect G. A. Lansburgh.

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Why not? The traffic congestion in the business section of cities not more than a quarter of a million in size cries for relief. Would it not be cheaper to provide elevated sidewalks in such districts than to delay the movement of trucks and street cars?

ELEVATED SIDEWALKS?

Elevated sidewalks would enhance the value of real estate. The second floor of a business building would then become the principal floor for retail trade, and the first or ground floor would be of greater value than the second floor now is. With the sidewalks elevated, goods could be taken into and from buildings more expeditiously than is now possible.

The elevated sidewalk merits engineering study as an economic device for relieving street congestion.

There probably will be no competition for a while at least for the San Francisco Tuberculosis Hospital Group, owing to lack of funds. Possibly this is just as well since so many architects have complained because the Supervisors ruled that only members of the profession who reside in San Francisco would be eligible. Several architects whose homes are across the Bay or down the Peninsula, not only maintain offices in San Francisco, but own property there and consequently are heavy taxpayers, but apparently that does not entitle them to participate in the competition. They must reside in San Francisco—be it in a hotel, rooming house or residence.

COMPETITION FOR THE TUBERCULOSIS HOSPITAL

"Of course, if I wanted to get around the provision," remarked one architect who is considerably perturbed by the ruling, "I could rent a room in a cheap lodging house, throw an old suit case in it and call the place my San Francisco residence. But I wouldn't give them that much satisfaction. Seems to me things have reached a pretty stage when a taxpayer is barred from competing for municipal work because he does not sleep in the town. And to add insult to injury there is no relief for me,

even on the other side of the bay. I live in Oakland but I am barred from competing for Oakland work because I do not maintain an office there. Guess about the only thing I can do to get in right on both sides of the bay is to rent a stateroom in one of the ferry boats and become neutral to both cities. But what's the use—there's nothing but expense and disappointment and trouble in competitions anyway."

BRICK AN IDEAL ARCHITECTURAL MATERIAL

Considered from the view-point of beauty, brick would seem to occupy a unique position among the structural materials available for the creation of beautiful buildings.

Brick is made in reasonable small units, so that in the case of many modern buildings, at least 100,000 of them show on the exterior. This, together with the varying shapes and sizes obtainable, make possible an almost infinite variety of form and pattern, thus giving full scope to the imagination, ingenuity and skill both of the designer and the workman.

Brick, moreover, is now made in almost every conceivable color and shade, the permanency of which is unequalled by hardly any other building material; with such a "palette," therefore, at one's command, and by a skilful use of color, the brick builder of today can readily add to his design that living touch which the painter gives us in his painting.

Brick may also be counted unique in the fact that it requires for its structural efficiency the use of a very considerable amount of material of quite another kind and color, namely, mortar; and, further, that this material must of necessity show in the form of a joint to a more or less degree in the face of the finished wall. A mistaken idea has prevailed that the mortar point is a blemish that should be suppressed as far as possible, or be colored to match the brick. We find, however, that the designer of today seizes the very opportunity afforded by a mortar joint to introduce into his wall another element of color and pattern.

The word "texture" has lately come into use in connection with brickwork, and, strange to say, this word has a very pausible application, for the builder of interesting brick work has much in common with the weaver at the loom as far as resulting color effect goes. Just as the weaver, with his threads of varying sizes and colors produces a never-ending variety of useful and beautiful fabrics, just so it is possible for the brick builder, with his bricks and joints of many colors and sizes, to weave new ideas and combinations in his work, all in beautiful and imperishable patterns; and this applies to all brick.

Just as the fabric charms and delights the eye, and at the same time protects men from heat and cold, and performs a thousand other useful functions, so the beautiful way of brick, exemplying man's ingenuity and his artistic skill, forms also the protective structure of the buildings erected for his use. Brick, therefore, would seem to fulfill to a very high degree the requirements of an ideal architectural material.

Want to Limit Height of Oakland Skyscrapers

The proposal being considered by the Oakland City Council to limit the height of future buildings in Oakland to fifteen stories has aroused the interest and comment of architects and builders of both sides of the bay.

Typical of the sentiment expressed is the following by B. J. S. Cahill, of the firm of Wright, Rushforth & Cahill of San Francisco:

"In the interests of Oakland, whose metropolitan aspirations are now so finely taking shape, it is to be hoped that the proposal to limit the height of buildings will be very carefully considered.

"The skyscrapee as a feature of the American city has come to stay. Where land is plentiful, as in Oakland, it may be all wrong, logically. If this is so, then why has the municipality set the example?

"The City Hall is a fine landmark from the bay and, like a surveyors' peg, it shows where Oakland is. But one swallow does not make a summer, nor one skyscraper a city.

"Let us legislate against any type of tall building that is unsightly in itself or likely to crowd the fine lines of the City Hall. With these reservations, the more skyscrapers the better."

The proposal to limit buildings to fifteen stories in height is said to have emanated from the office of Palmer, Hornbostel & Jones, architects of the new City Hall building. In making it they were actuated by a desire to prevent other buildings from hiding the hall.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

The Ability of Corrugated Culvert Pipe to Assimilate Expansion and Contraction Due to Temperature Changes in Pipe Lines

(Staff Article)

EXPANSION and contraction due to temperature changes is a matter of great practical importance in any form of pipe line, which is exposed or under only a shallow cover. Long lines of American Ingot Iron culvert pipe have been laid for sewers in El Paso, Texas. In the 4000 ft. sanitary sewer, built of this material, experience has shown that it was unnecessary to provide expansion joints. A number of engineers have noted this fact with interest. The elasticity resulting from the corrugations adequately provides for the natural expansion and contraction in the material.

The accompanying view shows an interesting application of this material in the practice of F. G. Dessery, Civil and Hydraulic Engineer of Los Angeles. The pipe shown is a 12-in. corrugated iron pipe 40 ft. long, connecting at each end with a concrete pipe line. The pipe, which forms a part of the Tapo Ranch Irrigation System, is carried over a deep arroyo on a wooden trestle.

In this irrigation system there are several crossings similar to the one shown, except that the others are made of ordinary plain, riveted steel and asphaltum dipped black pipe. Mr. Dessery reports that considerable difficulty has arisen in maintaining the bond between the steel and concrete pipes. In the steel pipe crossings the asphaltum was all scraped off of the pipe which was otherwise well cleaned at the region of the joint with the cement pipe. Heavy concrete anchor blocks were installed at contact points between the steel and cement pipe, but the expansion and contraction of the pipe line was enough to break the cement pipe several feet back of the anchor blocks.

In the case of the corrugated pipe it was Mr. Dessery's intention to place similar end anchor blocks, but in the haste to place the line in operation the blocks were omitted until a future date. They have not as yet been installed. Even without the anchor blocks there has been no cracking of the cement pipe where the corrugated pipe was used. This is accounted for on the theory that the corrugations provide for contraction and expansion without unduly increasing the end thrust of the pipe line.

View of Corrugated Culvert Pipe Carried Over a Deep Orroyo on a Wooden Trestle Without Provision for Expansion and Contraction

Advocates Concrete Coast to Coast Highway

CARL C. FISHER, vice-president of the Lincoln Highway Association, which is promoting the proposed $10,000,000 coast-to-coast road, and who recently paid a visit to California, points out the mistake of constructing highways of material that will require large annual expenditures for repairs.

Like Elwood Haynes, who recently expressed his conviction that cement concrete roads were far and away the cheapest in the end, as well as the best for traffic, Fisher is an outspoken advocate of cement concrete for good roads.

Fisher tells of mistakes that have been made in other States by building macadam roads, the cost of which was but little less than concrete in the first instance and which have required a tremendous annual expenditure for maintenance, while concrete roads are costing little or nothing to keep in shape.

"The example of New York should be considered," Fisher says. "New York State spent $50,000,000 for highways. They were built of macadam, and were no sooner completed than it became evident that under the heavy traffic the maintenance cost was going to be excessive. It has proved to be as much as $1000 a mile a year. Now they are beginning to build concrete roads, the maintenance of which costs next to nothing.

"In Europe, where the macadam roads were formerly kept up by one man working twelve miles, now, under the heavier traffic conditions, it has been found necessary to put three men on one mile. Now they are planning to substitute concrete for these macadam roads.

"Around Detroit there have been built about 200 miles of concrete roads, with a seven or eight inch concrete base and a four-inch floated concrete surface. The original cost of these roads is only $1500 a mile—they are fifteen feet wide—and the maintenance charge is practically nothing. It is estimated that they will stand up for twenty years without repairs, and that their life is practically indefinite.

"As a test, a road was constructed with macadam on one side and concrete on the other. The cost of the maintenance of the macadam half proved to be $800 a year, while the charge against the concrete was $3.75 for inspection.

"As the macadam construction costs $9800 a mile, it will be seen that the difference in first cost is insignificant

"In another test a road was built with macadam on the sides and a strip of concrete in the center, where it got the bulk of the wear. After three months a survey was made, and the depreciation of the macadam was estimated at 5 per cent and the depreciation of the concrete at nothing.

"Colorado has also adopted the concrete construction for its highways, and around Grand Junction there have been built several of these roads.

"The comparison with rock-asphalt is equally convincing. The life of a rock-asphalt road is estimated at four years, but the fourth year its condition will be poor.

"Some of these concrete roads are sustaining a travel of 3000 vehicles a day, which is an evidence of the great increase in road travel due to the use of automobiles. Some of these same roads formerly carried a traffic of hardly 3000 vehicles a month."

California Highways Will Rank With World's Best

Austin B. Fletcher, chief engineer of the State Highway Commission, on his return from the sessions of the International Good Roads Congress at London, declared that the State highway system under construction in California will rank on a par with any system in the world. The concrete-bituminous type employed by the commission is just as serviceable, says Mr. Fletcher, as the popular slag-tar highways of the European continent.

"California's 2700-mile highway system when completed with the resources available for its construction, will be on a par with any road or highway system in the world," he told the newspaper men of Sacramento. "It is gratifying to me to discover that practically all the road building experts of the civilized world are working along the same lines as the State highway commission in adopting a type of construction marked by a thin top surface over a strong foundation. Except in cases where traffic is abnormally heavy the greater part of the roads in England and on the continent are coated with a thin tar or bituminous dressing It is put on with the idea of being replenished.

"California must spend money for maintenance, too If the State wishes to have its highways kept up it will cost money The money available under the bond issue is probably enough to build the system outlined, but it is the annual road revenue which keeps a State in front rank."

Mr Fletcher says that on his trip he was everywhere closely questioned, both in the Eastern States and in Europe about the highways which California is building The congress, which lasted through one week, was attended by good roads representatives from fifty nations and each session was marked by addresses from noted engineers Three

languages were employed at the sessions, —English, French and German.

Shall Engineers Guarantee Estimates?

A certain city had a bridge to build a few years since and their engineer asked me to make some preliminary sketches, which I did. The matter was in charge of the Park Board and I found them very friendly and favorable to me as matters progressed until very suddenly I received a letter from their engineer advising that the Mayor of that city had requested that they obtain competitive plans, states a writer in the Engineering News.

Four engineers submitted plans and I was the last to be heard by the Board. I learned that the highest estimate given by any engineer was $22,500 and as that was exactly the amount which the Board had to use, it was somewhat natural that the estimates should be in that neighborhood. I told the Board that I was willing to guarantee my estimate at $21,000, to include all cost of construction and engineering fees and they said that the other three engineers were willing to guarantee theirs. I asked how they would make good on their guarantees and my Yankee Board came back with the customary question as to how I proposed to assure them that my guarantee would hold water. I replied by a Surety Company bond up to $10,000.

To make a long story short, the engineering was awarded to a firm of whom one member was a brother to the Mayor and as I cannot be brother to all the mayors, much as I should like to be, I lost the job. Also, the lowest bid received on the plans was in the neighborhood of $29,000. Of the other two plans, neither could have been built with profit under $25,000.

I have had nearly 300 bridges erected under my own supervision and I have the detailed costs of nearly all of those bridges; so when I desire to make an estimate on a proposed bridge I use those figures to make an estimate which is just about right for an experienced contractor to do the work with a reasonable profit; and I stand ready to guarantee, if necessary, that it can be built within those figures. The average competing engineer has either never designed a concrete bridge or but a very few at the best and some of the estimates are either so high or so low as to be laughable.

It makes no difference whether the engineer be designing bridges, buildings or what you will, if he has had the experience which enables him to make a safe and sure estimate of cost, the only protection which he has against the inexperienced competitor who swears he can accomplish the work for a smaller sum is the guaranteed estimate.

A School House Built for $500

"A California School House for $500," is the name of a useful and suggestive bulletin from the office of the superintendent of public instruction. Its avowed purpose is to stimulate the school trustees of the State to think about and to discuss the building of school houses, on the theory that what they feel and think is of great importance to the commonwealth. The trustees hold the purse strings, and their ideas shape the school houses and affect the landscapes of the State.

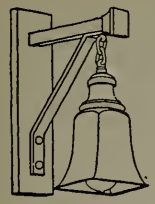
The bulletin pictures and describes a very attractive and convenient little outdoor school that is being used in considerable numbers in the city of Fresno. It has a substantial floor, a good roof and solid walls as high as the blackboards. Above the blackboards the wall space is open to the outdoor world, and the school room is a delightful place, where the youngsters can feel the breezes, hear the outdoor sounds and see the sunshine flickering in the trees. The circulation of air and the diffusion of light are ideal. The pupils and the teachers prefer these school rooms to any others, because they feel well and study better in them. Unpleasant odors of garlic and the deadly school room smell disappear. Flies and insects are kept away by screens, and in case of wind or rain the open spaces are covered by canvas awnings, tied down. A stove is provided for cold weather.

Floor plans, specifications and list of materials are provided, so that the building may be constructed by any handy carpenter. The cost in Fresno is less than $500 all told.

Wine Association Has Splendid Plant

The California Wine Association has under construction several additions to its large plant at Winehaven, on the Richmond water front. The improvements include a reinforced concrete addition to the present storage and fermenting cellar covering an additional area of 137x228 feet, and two stories in height. The upper room floor will be used as a fermenting room, capable of fermenting 2,500,000 gallons of wine during vintage season; also a complete wine-pressing plant and a crushing plant with a capacity of 500 tons of grapes a day.

Other work under construction is a social hall and bungalows for the men employed at the plant. The cost of these new buildings, cooperage and equipment, is estimated at $100,000. The buildings were designed by John H. Powers, architect of San Francisco.



Heating and Lighting

Plumbing and Electrical Work

Electricity and the Architect

By FRANK E. WALLIS*

LIGHT is the fundamental source of design and composition in architecture, high lights, shades and shadows being the pigments with which the architect expresses himself. Remembering that the Greek temples and the Gothic cathedrals were designed by architects who depended on the light of the sun for the lead in their pencils, electrical men must appreciate the importance of their inventive powers, as they have practically formed a light trust in competition with the Almighty, and natural light is useful today only for a minor portion of our waking hours.

The modern architect must, when designing and composing his interiors and his exteriors of homes, churches, public buildings and offices, take under careful advisement the use and misuse of light, and in designing his cornices, his moldings and his solids he must, in lieu of a pencil tipped with sunlight, supply himself with an electric light plant.

The electrical engineer, however, in his efforts to parallel the light of the sun, has forgotten the shadow in his struggle for artificial daylight. This may be extremely useful and sane in many places, but forbear, I beg of you, the violation of the law which gives us the subtle shades and shadows, fleeting mysterious, and housing dreams and fairies, the inspiration of song and story for the poet and the artist since the world was young.

Remember the story of the efficiency engineer with his stop watch held on a couple of young people kissing. "You have used sixteen motions for that kiss, when it should have been done in two," forgetting that the fourteen love pats were worth more than the kiss, and so that shadows and shades are of more value than the perfect light.

In addition I want to suggest the necessity of some knowledge of the styles and of some of the laws of architecture so that you may comprehend to some extent the desire of the architect to soften or to accentuate his work with light and her sister shade, and that you may at the same time join with him in the development of good architecture and of good business.

In the great modern renaissance in the arts and sciences where the city authorities of this country are planning their great civic centers of magnificent court houses and monumental city halls, light, properly designed and properly placed, is a most important factor, but a factor that is more or less neglected. The architects of the Panama Exposition are designing great courts surrounded by facades with monuments, fountains and sunken gardens which will be seen and appreciated by the public during the greater portion of the time with the aid of your substitute for God's sunlight. Electrical men should insist on the recognition of their high place in the councils of trained imagination and should demand some share of the glory which comes from the result of their deliberations.

I would suggest that the Society for Electrical Development appoint a committee to consult in some official capacity with the American Institute of Architects. This society, with the central body in Washington, made up of permanent and working committees on competition, on education, and on laws, has chapters throughout the United States, each chapter working in the same manner in its own locality. Consulted by presidents, by governors, and by the mayors of cities, the society has done work of a great educational value. I, myself, am a Fellow of the Institute and know from the inside the broad-gauged co-operative work which is being done, and I am sure that through the official monthly publication of the Institute of through some method which only such an organization as yours could devise, co-operation could be had where the question of education could be developed. Care should be taken, however, to approach this question only through the higher channels of your mind, for the Institute develops gooseflesh at the mere mention of commercial-

*The relations which should exist between the architect and the engineer have seldom been so well presented as in Mr. Wallis' address delivered at the recent conference of the Society for Electrical Development.

ism, being ultra-professional and wisely so.

All of us will do better work when we do it in a broad-minded spirit of co-operation and the returns, both financial and otherwise, will be greater according to the greatness of our ideals.

Let me also beg of you as a practicing architect with the peculiar difficulties which always surround our professton, to send your gospel of more light, and better light, of heat and power, and the economies of electricity, the enemy of disease, of crime, and of barbarism, to our public officials and to our clients, so that you may enjoy with us the game of life and light and color.

For according to the quality of your offering to the real civilization, so shall its returns be to you.

"In the ranks of industrialism the baton of the field marshal is at the bottom of every recruit's knapsack, although not everyone has the wit to find it."

I had an interesting and instructive visit with Mr. Leon Gaster while in London this winter. He is doing great work both with the Continental governments and with the British parliament on efficiency lighting in factories and workshops. He remarks that the boards of health seem to care more for the posterior end of the alimentary canal than for the windows of the soul, and he has insisted that the various boards of health should consider carefully the effect of light on the health of the workman.

I am now going to presume on my position as a guest and criticize you. My premises are these: While the composer in form, called by the conventional the artist, works with his trained and fluid imagination, he does so subject to fixed and scientific laws which are the result of time and study, and which have been subject to the most jealous scrutiny. It is because of his knowledge of these fixed laws that he admires and marvels at the work of the engineer. The engineer, illuminating or otherwise, makes little, if any, allowance for the excited enthusiasm of the man who composes, knowing the laws but playing with them, for he frequently confuses this exhilaration and keen expression of love with the uncertain and the false, though sometimes helpful, inspiration which comes from the long bottle. And in addition, the artist, in his mind, is most frequently queer.

Now the man who creates feels this and resents it, and very naturally shys from an association with this sort of scorn.

You men of the central stations, of the manufactories, of contractors and of the sales departments must know that a close relation between yourselves and the architects can only result in economy of construction, in the development of each portion of the work, in added profits to all of us, and to an increase in the returns to the owner on his investment.

We have in our office at the present time a couple of factories, an office building, a loft building, some country houses, some landscape work, a laboratory, and odds and ends of consideration and alteration. All of these problems are worked out under the same formula and with the assistance of engineers of the various requirements, and of clever salesmen and supply men. We architects want co-operation, and this criticism suggests that while you should learn something of us, that we should also learn from you and welcome your data and your suggestions.

Finally, I would like to grow a little personal with you. I am one of those whom men call, to my sorrow, an artistic man, but only because I have the love of form and color. I have wandered among the old and the new, having no prejudices and no pre-conceived notions, although I have made in my peregrinations a collection of clients and added to my library on human nature.

I have visions of your dreams and knowledge of your difficulties, and I have this message for the real men who have a desire for success through their business association. In my opinion you are playing the big thing. You have the power of happiness in your hands, both for you and your families and the world. Play the big game and play it to the limit of your powers. You have all the essentials of life in your palms, heat, power and light. Without them we relapse into barbarism and to you, rather than to the ministers of the gospel, we look for salvation and progress. Study the broad way and avoid the petty. Realize that yours is the method and the manner which will guarantee big returns, in warmth from your control of heat, in progress because you have power, and in light and love, for from you we must get all the joy of life. You owe to the civilization of the future more, much more, than the civilization of the past has given to you, and you are given a privilege which is not given to men of other business.

You are parallel with nature and with the Almighty. Play the game or lose yourself in the loneliness of failure and of self-prostitution; for when you play the game and play it big you must be insured the big profits, and this need not necessarily mean an enlarged bank account.

Concrete Pier Bridge

The Board of Supervisors, Sacramento, has adopted the plans and specifications of County Surveyor Miller for a new concrete pier bridge to replace the old Twelfth street bridge over the American River. According to the estimate, the bridge will cost $82,000.

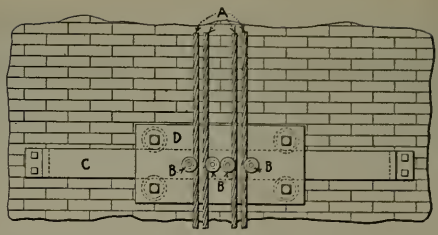


FIG. 1

Device to Prevent Swinging of Elevator Cables

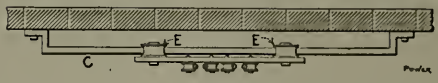


FIG. 2

Takes the "Jump" Out of Elevators

Of course you have been in a "jumping" elevator, haven't you? It was not pleasant, you'll agree. But did you stop to find out what made the car jump? Did you realize what a menace to the public safety is involved in the problem?

William Kavanagh is the man who has taken the "jumps" out of elevators by a very simple device described in a recent issue of Power.

The hoisting or lifting cables of elevators are likely to leave the grooves of the winding drum from any one of the following causes: First, if the drum unwinds too much; second, if the brake should close on the brake wheel while the car is in rapid motion; third, if the sway or side lash given to the cables is conveyed to the hoisting drum. Any or all of those three reasons will cause the cables either to become loose or ride on the neighboring convolutions, which, of course, will cause more or less trouble. Sometimes a sudden reversal of direction of motion of the car will cause the cables to sway, and in numerous cases this sway is caused by a quick stop or start of the car, which may cause the cables to jump out of their grooves. The car must then be stopped to place the cables in the proper grooves.

To do this the try-out or "baby switch" is thrown over for hand operation from the control board and the car is lowered until the cables are unwound and placed in their proper position on the hoisting drum.

When buildings are high or moderately so the swaying of the cables is often a great source of annoyance, and when the hoisting mechanism is placed in the cellar or basement of the building, the swaying of the cables is augmented. Owing to their increased length, the cables are more likely to jump out of their grooves. To offset this sway effect the device shown was installed and operated with success.

This sway absorber is placed on the wall of the elevator shaft. The hoisting cables A move up and down between the wheels BBB. A flat bar of machinery steel C is fastened to the shaft wall. On this bar or guide rides the oblong apron D, which serves as a frame for the wheel EE, Fig. 2, which roll on the bar C.

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Germany is Scientifically Steamheated

DURING the last decade the installation of hot-water and steam heating, and for large buildings the necessary ventilating facilities in conjunction therewith, has made enormous strides in Germany.

The high cost of raw materials, both for combustion and the heating plant itself, has necessitated greater economy in installing and daily operation; hence the obvious reason for their greater advance along these lines. Scientific study has enabled Germany advantageously to compete with all foreign competitors, not only in their own country but in most others where tariff restrictions are not too great, comments Power.

The fuels mostly in use are coke and a noncoking brown coal (lignite), the former being a byproduct of gas works and reducing ovens and the latter a very cheap form of soft coal low in heat units. The cheapness of this fuel has resulted in overcoming the difficulties of obtaining efficient combustion with such a poor class of fuel.

All towns and cities are governed by a general and very strict smoke ordinance, which applies to house heating as well as power boilers. At the same time all cheaper classes of fuel, especially of the lignite variety, tend to give a noxious and easily detected smoke when the combustion is not complete. Hence great difficulties have had to be overcome in manufacturing boilers to give satisfactory and economical service at the same time to comply with the laws governing their operation.

House-heating boilers for both steam and water systems are sold on a basis of heating surface, the average price being 50 to 70 marks ($11.90 to $16.67) per sq. m. (10¾ sq. ft) heating surface, depending on the size and quality. Radiation, on the same basis, costs 6 to 7 marks ($1.43 to $1.67) per sq. m. heating surface. It is usual to assume an additional 20% to cover the cost of installation

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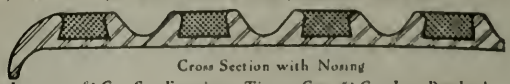

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The Ventilation of Picture Theaters

A British correspondent writes in reference to the very successful application of what is known as the "Dupor" system of ventilation to picture theaters. The great possibilities in connection with moving pictures and color displays has taken hold of the British public, and they throng in thousands to the new picture palaces which are being built all over England. Incidentally it would appear that the moving picture displays, and those newer applications of science which render the screen unnecessary, have not only been made use of to represent laughable incidents and current events, but business men are using them as advertising mediums.

Such theaters necessarily need ventilation, for in an exhibition where science is seen in the most up-to-date manner it is only reasonable to suppose that the manager and the builders will be up-to-date in lighting, heating and ventilation. Among the different schemes which have been applied mention should be made of the "Dupor" system, a very important installation of which was carried out recently at the Maida Vale Palace, London —a splendidly appointed building. It may be explained that "Dupor" means duplicate power, and the patentees have earned their success by the application of mechanical means aiding natural laws, that is to say, while acknowledging that the principle of natural ventilation is the right one, it is recognized that it requires assistance under exceptional conditions.

The system adopted in this particular instance is the use of a powerful cone and extractor known as the "Barrol" which draws upward all foul air and gases through main trunking to a central shaft, from whence it is carried through the roof into the open air, the natural ventilation of the inlet coming in at a suitable distance above the floor. When this remains stagnant powerful electric fans are brought into operation, sucking the air upwards into the cone. They are economical in use in that they cease working the moment the updraught is sufficient without their aid. The fans are regulated, too, so as to prevent any superfluous draught.

In the particular instance referred to there are three small fans over the gallery, the central pit being ventilated by one large one in the centre. The system has been found very satisfactory, and is being adopted in England in many of the picture palaces that are springing up everywhere.

What California Towns Are Doing

Watsonville is undertaking a lot of street repair work.

Hayward decides to pave its streets with asphalt macadam.

Richmond is about to put down bitulithic pavement on Espee avenue.

Albany is about to put a sewer in Curtis street, also concrete curbs and gutters on Passen avenue.

Santa Rosa will pave Fourth street with bitulithic pavement.

San Rafael will soon start proceedings for a lot of municipal improvements, including street work, costing over $100,000.

Dinuba citizens are planning street improvements to connect with the Fresno highway system.

Visalia has ordered a class A pavement on West Main avenue.

Palo Alto will pave Forest and Middleton road with asphalt.

Sacramento will construct curbs, gutters and sewers on seven blocks of D street; also put down an asphalt concrete pavement on two blocks of Eighth street.

Mayfield trustees are discussing paving of Main street.

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By the Way

Some Industrial Information Worth the While

Advantages of the Sliding Door

The Richards-Wilcox Manufacturing Company of Aurora, Ill., recently concluded a successful contest for the best articles on the "Advantages and Conveniences of Installing Sliding Doors in the Modern Home."

After carefully reading every reply and thoroughly weighing and considering the many strong points advanced in favor of installing sliding doors in the modern home, the judges, Mr. Lewis W. Harstig of Sargent & Co., Mr. R. J. Kleinsmid of Yale & Towne, Mr. W. J. Patterson of P. & F. Corbin—men of extensive experience in all branches of the hardware business—selected and labeled Blanche Ayers' article as "best."

The second prize, $30, was awarded to Mr. John R. Higgins of the Gregg Hardware Company of Detroit, and the third prize, $20, to Mr. H. H. Cahoon of Pittsburg, Penn.

None of the articles were signed. Before the prizes were awarded the judges, even had they desired, had no means of knowing who wrote the winning articles. Every article was carefully considered.

Miss Ayers' article seems to cover every point as to the merits of the sliding door, clearly bringing out the many desirable advantages sliding doors offer over swinging doors and plain cased openings.

Here is the prize winning essay:

The sliding door is more convenient, more artistic and more durable than the ordinary swinging door, and also has advantages over the plain cased opening.

A sliding door takes less space when open than the hinged door. When the door is open it is entirely out of the way, and the space which would be used for the door to swing back, can be otherwise utilized. The appearance of the room is also improved by having sliding doors, as the hinge doors when open are clumsy.

When a door is once hung with a good reliable hanger, and has a good, substantial track on which to run, there is no trouble with the door sagging. If any trouble arises it can be remedied by adjusting the hanger without taking down the door. A door on hinges, when out of plumb has to be taken off and refitted and rehung.

The sliding door is more economical than the plain cased opening in the long run. There can

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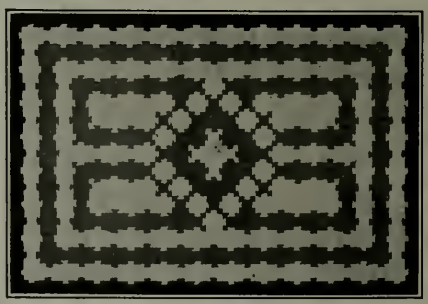

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be a saving in fuel, especially in houses heated by stoves. The opening can be closed and only closed up portion of the house heated. In cleaning, one room can be cleaned without having to clean all the house if there are doors to close the openings. The sliding doors answer every purpose of the plain cased opening, and have the advantage of having doors that can be closed when desired.

"Kahn Systems Standards" Hand Book on Reinforced Concrete

This new edition contains numerous additions and revisions over previous issues. The "Kahn System Standards" is generally recognized among engineers, architects and builders as the standard handbook on reinforced concrete. It is used as an auxiliary textbook in many of the leading technical universities.

The new edition contains the following new features, which appear for the first time:

Photographic views of various types of reinforced concrete structures; interior views of various types of reinforced concrete floor construction; complete specifications for reinforced concrete; illustrated discussion of the advantages of reinforced concrete construction; tables of comparative cost of reinforced concrete, wood mill construction and structural steel; floredome and floretyle construction; many new tables, including those for beams and also a complete revision of the text matter.

"Kahn System Standards" is divided into sections covering completely the following matter:

Advantages of rigid connection of shear numbers.

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Tables for Reinforced Concrete Footings.

Materials in concrete and mortar and estimating table.

"Kahn System Standards" is issued primarily for practising architects, engineers and contractors, to whom it is distributed free. To others a nominal charge of 50c per copy is made. Published by the Trussed Concrete Steel Company, Detroit, Mich.

Important Power Development on National Forest in California

The Secretary of Agriculture has just issued a permit to the Pacific Light and Power Corporation of Los Angeles, to construct and operate a series of power plants in the Sierra National forest. The company plans to build four power houses, two reservoirs, and twenty-five miles of cement-lined tunnels. On account of the magnitude of the construction work and the amount of power to be disposed of, the permit provides for construction extending over a period of twelve years. Under a temporary permit the company has already nearly completed the first step of this development, known as the "Big Creek Project." This work is being done by the Stone and Webster Engineering Corporation.

The ultimate development proposed is about 150,000 horsepower. The greater part of this power will be transmitted 240 miles into Los Angeles and vicinity and will probably be used in large part on further extensions of interurban railway systems. It is also expected that considerable quantities of this power will be utilized in pumping water for irrigation in the upper San Joaquin valley. The power will be transmitted over a double steel tower line strung with stranded aluminum cables and at a pressure of 150,000 volts, the highest yet attempted in commercial transmission.

This development of the Pacific Light and Power Corporation is one of several under way or projected upon national forest lands in California. Among these are the projects of the Great Western Power Company on the north fork of the Feather River where a reservoir of forty-three square miles is to be constructed and power plants with a capacity of about 350,000 horsepower are to be built. The Southern California Edison Company is planning for the development of four plants on the Kern river. The Pacific Gas and Electric Company is constructing on the South Yuba, one of the highest masonry dams in the world. The greatest water-power development in the history of the State is now under way and most of the plants proposed or being constructed will occupy national forest lands under permit from the secretary of agriculture.

Panama-Pacific Exposition Progress

In his report to President Moore, Director of Works, Harris D. H. Connick, of the Panama-Pacific International Exposition, states that twenty-two important contracts have been completed and that work on the remainder of the contracts is well under way.

Mr. Connick states that more than 270 head of stock are engaged in the work of grading the Exposition site and the contract for the construction of the freight slip and its approach is nearly completed.

"Progress on the construction of the Machinery Building," said Director Connick, "has been most satisfactory during the past thirty days. For the month of June 2,150,000 feet of lumber was erected in place and this was on an average of 70,000 feet per day.

"Frame work on the construction of the Palace of Education started on the tenth day of May and about 900,000 feet of lumber has been placed to date, making a daily average of 30,000. A large portion of the floor of the Education Palace has been laid and about 300,000 feet of lumber has been used in the floor work of the Palace of Agriculture. The three fire stations will soon be built, the work actually having been completed on one of them.

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"The work of enlarging the sculpture models to full size is progressing successfully under the direction of A. Stirling Calder, Acting Chief of the Department of Sculpture. He is now employing a force of twenty sculptors, painters and helpers.

"Warehouse No. 2 is rapidly nearing completion. The plan covering the electrical installation in the various buildings is well under way, as are also the architectural plans for the various courts and buildings."

Why Concrete Needs to Be Waterproofed.

The latest catalogue of the Ceresit Waterproofing Company of Chicago is called their international catalogue because it describes and illustrates buildings in all parts of the world that have been waterproofed with their famous waterproofing compound.

There is no country of importance and no class of building in which this compound has not been tried and given the best of satisfaction. Palaces and hotels, postoffice buildings and railroad stations, water towers and bridges, vaults and aqueducts, lighthouses and warehouses, tunnels and swimming pools, all are found among the constructions subjected to the waterproofing methods of the Ceresit Waterproofing Company.

Another notable piece of advertising just published by the Ceresit Company is a unique book entitled "You Are the Judges," the contention of the manufacturers being that Ceresit has "all of the good points and none of the bad," and the building public is the jury from whom the verdict must come.

Here is what the manufacturers have to say about the necessity of good waterproofing compound in concrete work.

Waterproofing is absolutely essential to modern concrete construction. Upon this, architects, engineers and contractors all now agree. But this is a fact that is not as yet recognized by the rest of us as it should be.

Most of us are not aware that concrete is as porous as a sponge, and that it is practically worthless for most forms of concrete construction unless it is thoroughly, permanently and dependably waterproofed.

The trouble is not that the public has not given waterproofing a fair consideration. It simply does not even occur to them. They do not even inquire into it—or argue with you about it—just naturally get along without it. Many builders do not even know that there is such a special preparation in general use as a waterproofing compound for concrete, cement, mortar, etc.

Nevertheless it is a fact that concrete does not keep out moisture. Furthermore, it is a significant fact because it generally means unhealthy, damp conditions—discomfort—possible spoiling of walls and wall decorating, giving that unsightly, dark, soaked appearance—spoiling food stuffs—decay in cellars—corrosion of steel reinforcing that enters the concrete of modern structures—either a contaminating inflow or wasteful outflow in reservoirs, tanks, and dams—damage by rust to machinery—handling of 25 per cent less flow by sewers—undesirably high temperature in refrigerating plants—financial loss in concrete superstructure, peeling, etc.—damage to cement plastered exteriors, or concrete block construction, concrete roofs, tunnels, silos, swimming pools, etc.—rain beating against the face of concrete walls, penetrating and communicating dampness to the interior.

No matter what you build, or where or when you build, you need waterproofing, because it is the only certain means of preventing the penetration of dampness and water through structures of all kinds.

The new catalogue tells you everything you desire to know about waterproofing—its origin—its uses—its advantages, etc. It also explains to you fully why Ceresit, a cream white paste of about the consistency of butter, and which is easily dissolved in the gauging water, renders concrete construction absolutely waterproof for all time.

Napa Hospital Improvements

The Board of Managers of the Napa State Hospital, the Superintendent and Steward of that institution and the State Engineer met recently to discuss building projects and reclamation work which it is planned to carry on at Napa during the next two years.

The last Legislature granted total special appropriations of $154,800 to be devoted to the erection of new buildings, remodeling of certain others, steam piping, electric rewiring and the reclamation of land along the Napa river.

The appropriations become available on August 10th and it is the purpose of the Board of Managers to [illegible] construction and development work [illegible] as possible that the hospital may be put in better shape to meet the needs of its inmates.

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Keying An Ad

Keying an "ad" and paying a clerk to keep tab on "inquiries" is good business in a ten-cent mail order proposition, but doesn't work out on anything bigger. We know a wall-board man who got 480 inquiries from a farm journal "ad," sent out a stack of catalogues and booklets, chased follow-up letters out in one-two-three order and has yet to sell a single foot of the board to any of the idle curious who answered his advertising. The same manufacturer got but two inquiries out of an "ad" in a building magazine, but sold both parties.—The Builders' Guide, Philadelphia.

Advantages of Cork Coverings

The Armstrong Cork Company has published its 1913-14 price list in an attractive brochure, which also contains the following terse description of Nonpareil Cork Covering:

"Nonpareil Cork Covering is the only thoroughly satisfactory covering for brine, ammonia and ice water lines, and cold pipes of every kind. It consists of pure granulated cork, compressed and molded in sectional form to fit the different sizes of pipe and various fittings in ordinary use. It is coated inside and out with a mineral rubber finish and is applied with waterproof cement on the joints, rendering them impervious to moisture.

"Nonpareil Cork Covering possesses maximum insulating efficiency, is remarkably durable in service, is light, clean, neat in appearance and very easy to apply. On a brine or ammonia line, under average conditions, it will pay for itself in a single year. A booklet entitled, "Heat Transmission Tests on Nonpareil Cork Covering," sent on request, renders it easy to figure out how much can be saved in any given case by installing it."

Big Steel Inspection Contract

The new Equitable Life Insurance Building in New York, 38 stories high, will contain approximately 36,000 tons of structural steel, the inspection of which, both mill and shop, has been intrusted to Robert W. Hunt & Co.

Fink & Schindler Given Nice Contract

The Fink & Schindler Company of San Francisco has been awarded the contract for the oak woodwork for pipe organ for the First Presbyterian church of Oakland, Wm. C. Hays, architect. The contract price was $1850. This will be one of the largest and most elaborate pipe organs on the coast.

THE SUN ROOM

OF THIS HOUSE IS A DELIGHTFULLY AIRY PORCH IN SUMMER FOR IT IS COMPLETELY ENCLOSED WITH **ENGLISH CASEMENT WINDOWS** AND THEY ARE AMERICANIZED FOR THE OWNER WAS WISE ENOUGH TO EQUIP THEM ALL WITH OUR ADJUSTERS WHICH ARE EASILY OPERATED FROM INSIDE THE SCREENS.

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Metal Lath Ordinance for Los Angeles

The city council of Los Angeles has passed a new ordinance, prescribing the method of using metal lath in the construction of buildings. It provides that all metal laths required on ceilings shall be securely fastened to the joists or furring strips, where such furring strips are of wood, by means of wire staples not less than three-quarters of an inch in length and spaced or driven not more than eight inches apart. Where such furring strips are of metal, such metal lath shall be securely fastened to such furring strips with galvanized iron wire of not less than No. 14 gauge, provided, however, that metal lath constructed with steel ribs not less than one-half inch in width and spaced not more than eight inches apart may be fastened to joists by means of barbed roof nails not less than one inch in length driven through said steel ribs and into the joist. Every such nail shall be driven through the metal lath and into the joists to its head, and all the nails shall be placed not more than eight inches apart.

Examining Board for Architects Upheld

The Supreme Court of Illinois recently handed down a decision to the effect that the State Examining Board for Architects has the right to act for the purposes for which it was created. Last October a committee of the Chicago Architects' Business Association laid before the State Examining Board for Architects a mass of papers tending to show a violation of the law in the proposed construction of a theater, plans of which had been prepared by David Saul Klafter. Mr. Klafter sought and obtained from the Superior Court of Cook County, without a hearing, an injunction, forbidding the State Examining Board for Architects from taking action in the matter, claiming that the law, which gave the examining board the right to revoke licenses, and particularly Section 10, was unconstitutional. By the decision of the Supreme Court of the State, rendered recently, this injunction has been dissolved. Now that the question of the authority and legality of the State Examining Board for Architects has been called into question the board has, through its attorney, Henry R. Baldwin, made application in the court for a mandamus to compel the owners of buildings to construct the same in compliance with the law. The net effect of the decision is to secure the better enforcement of the building laws of the city and State.

Quick Work.

An example of uniform effort was enacted at Los Angeles recently in the razing of the two-story and basement brick and stone building at the northeast corner of Fifth and Broadway by the F. O. Engstrum Company, which has the contract for the new ten-story and basement store and office building for the Metropolitan Fireproof Building Company, and which is to occupy the same site. The lot has an area or 115x161 feet and the improvements were entirely removed in seven days. As the time limit for the construction of the new building has a penalty of $300 per day after February 15, 1914, it is presumed that the same amount of diligence and dispatch will be shown by the company in its efforts to complete the work on time.

Sheet Metal Fish Tanks

Olive, Cox & Leary, the well known San Francisco sheet metal workers, recently have completed five galvanized iron tanks in the recesses of the basement of the building at Pine and Kearny streets. The tanks are for live fish which are to be used as an advertisement by the West Sacramento Land & Investment Company. The five tanks hold about 275 gallons of water and are equipped with glass tops so that the fish may be seen from the street. The same firm has recently completed the sheet metal work on a number of nice residence jobs, including the Lawson house in the Presidio district.

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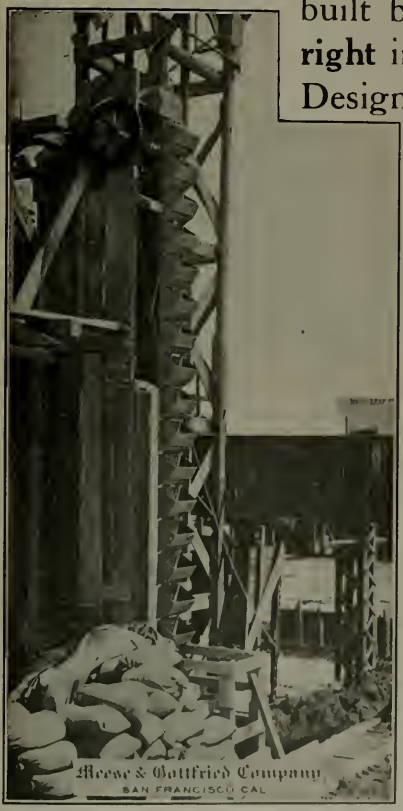

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The "Prometheus" Electric Food and Plate Warmer owes its popularity to its qualities of convenience and efficiency. It is convenient because always ready at the turn of a switch, and requiring no other attention whatever. It is efficient because, as made by us, the heating equipment is scientifically designed and applied as part of the apparatus, and the cost of operation does not suffer by comparison with gas.

The handsome appearance while incidental, is evidence of careful workmanship and the desire to produce an article which, besides being useful, will add to the appearance of the butler's pantry.

For more particulars drop a postal to the San Francisco distributor, M. E. Hammond, Humboldt Bank building.

Meese & Gottfried in Larger Quarters

On account of the rapid growth of business since the great San Francisco fire, the Meese & Gottfried Company have been obliged to move their main offices in San Francisco from the old location at 55 Main street to the four-story steel frame building at 660 Mission street—just back of the Palace Hotel—where with the most up-to-date engineering and sales departments they will be better able to handle the many problems in transmission, elevating, conveying and screening machinery, for the manufacture of which class of machinery the firm has the largest plant on the Pacific Coast. They maintain branch houses and carry a complete stock in Vancouver, B. C., Seattle, Portland and Los Angeles.

Wiring His Specialty.

W. H. McConnell, formerly proprietor of the Globe Electrical Company of Monterey, is a new comer to San Francisco. Offices have been established at 120 New Montgomery street, Mr. McConnell having disposed of his interest in the Monterey business. Among the buildings wired by Mr. McConnell are the Hollister theatre, San Leandro and Gilroy high schools, Watsonville, Salinas and Monterey theatres and Carnegie libraries at Paso Robles and Pacific Grove.

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Municipal Group, Springfield, Mass. Tower Equipped With Howard Clock

The Clock in the Tower

By W. G. ELTON*

THE tower clock, that is the "clock works," somewhat resembles a large piece of machinery, and is located on a cement floor that is 24 feet below the center of the dials. The "works" are built up on a very heavy cast iron bed piece that is rigidly braced and supported about 36 inches from the floor. On this cast iron bed are placed the three main schafts of the clock. These shafts are made from shafting steel bars two inches in diameter, and are each 24 inches long, with bearings carefully polished and running in heavy clock brass boxes bolted to the iron bed. The center one carries the great wheel and going barrel of the time train, the wheel being 16 inches in diameter and one inch thick. At the right hand end as you face the clock is the great wheel 22 inches in diameter and 1½ inches thick, with its cam ring and cable drum that operates the big hammer that strikes the hour strokes on the largest bell. At the other end of the clock is located the main chime wheel with four cam rings, to operate the hammers that peal the Westminister chimes on the quarter hours; the four bells used for the chime weigh respectively, 3000 1200, 800, and 550 pounds.

The driving weights for the time and hour strike are supported by extra flexible crucible steel cables of such strength that they will amply support four times as much weight as will ever be required to run the clock. The weight to operate the chime hammers is carried by a sprocket chain similar to that used for the chain-drive on automobiles.

The various trains or sets of wheels and pinions that control and govern the speed of the striking and running, are located in cast iron frames mounted on the bed piece and secured at the top with a bridge piece known as the frame cap, that in addition to bracing and holding the frames furnishes bearing for the upright shaft of the clock and houses the pendulum hangers. All pivots and bearings are carried in removable bronze bushings or boxes, with oil cups, oil holes and grease channels, as it is very essential to the proper running of a clock that all its bearings be nicely oiled and kept in smoothest condition.

The escapement used in the clock is the Denison double three-legged gravity type, selected always where accuracy of time is desired and where the clock is to be used on heavy work, such as pulling around extra large or heavy hands. The

*Mr. Elton is connected with the E. Howard Clock Company, and had charge of the installation of the big clock in the tower of the new municipal building at Springfield, Mass., to which the accompanying description refers. This building, or group of buildings, is about completed, and they have been pronounced among the best in the country. The architects were Pell & Corbett, with Hollis French and Allen Hubbard as consulting engineers.

pendulum is of steel and zinc construction, about 16 feet long and beats but 30 times a minute. It is a compensated pendulum, the peculiar arrangement of the metals keeping it at the same length in all temperatures.

At the top of the clock frame projects a shaft that runs in upright position, its lower pivot resting on a very hard steel endstone. This shaft by means of steel tubing and universal joints connects to the under side of a cluster of large bronze bevel wheels, located 24 feet above the clock, on a line wtih the dial centers; this long upright shaft in turn rests upon roller bearings at the top of the clock. From the bevel wheel cluster, connection is made direct to the dial works of the north dial, and also to the west and east dials; but at the west dial are more bevel wheels and the drive is across the corner of the tower to the south dial, this being necessary to avoid the elevator shaft that passes up through the clock room.

The dial works, or motion wheels, as they are often called, are constructed stronger than is customary because they must reach through the wall and carry the special hands that are much heavier than are usually put on a tower clock. These hands are of electrically cast bronze metal, the minute hand being 10 feet long and 20 inches wide, and the hour hand 7½ feet long and 17 inches wide, and with all fittings in, weigh 300 pounds to the pair. The hands are hollow, and on the front of each is a leaded glass strip extending from the center outwards almost the entire length of the hand, and back of this glass are placed two lines of electric lights; the center or hub of the minute hand is also glassed over and illuminated. It is easy to describe this, of course, but when it is considered that these hands are moving all the time, one at the rate of one revolution an hour and the other once in 12 hours, the problem of getting the current there and keeping it there, and providing against rain, snow and ice, was one rather difficult for the makers to solve.

The dial figures are of cast bronze, securely bolted to the stone, and finished in the finest gilt; every figure has at its center a circular piece of glass six inches in diameter, and back of each glass is a hole clear through the wall to the inside of the tower, where strong electric lights are to be placed to light up the 12 glasses that appear on each dial, and after dark designate the exact location of the dial figures, and this with the radial lines of light locating the hands, insures the reading of the time of night, as easy as the time of day. The lighting feature of itself is wonderful in its details, and the clock carries an automatic device that switches on and off the current, to agree with the varying hours of darkness as the seasons change.

The bells are located far up above the clock and are reached by means of a complication of levers and rocker arms and pulls made of galvanized wire links. The clock is to strike the hours always, but will play the chimes on the quarter hours from 8 a. m. to 6 p. m. only, playing the recognized form of Westminster quarters chime: four blows first quarter, eight at second, twelve at third and 16 at the fourth, the fourth chiming just before the hour strokes are sounded. A device on the clock cleverly cuts these out and in at times desired. During the night while the chimes are silent, the passing of the quarter hours will be noted by the flashing of lights from the glass ball at top of the tower, a specially arranged electric contact being put on the clock to make this signal exactly agree with the clock time.

It can safely be said that this is one of the finest and largest installations of a going clock, direct-connected to its work, ever erected in this country. It was all built in a modest five-story brick building located in the old town of Roxbury, where many hundreds of tower clocks and quantities of other clocks of all descriptions have been built during the last 60 years; where each skilled workman has his own particular work to do, and is extremely jealous of his productions, permitting no slighting of the work, but maintaining always the standard of excellence of the Howard Clock Company.

* * *

The Howard Clock Company is well represented on the Pacific Coast and is in a position to manufacture and erect high-class clocks of all sizes for public or private buildings. The Coast agents are: Morgan & Allen Co., San Francisco; Jos. Mayer & Bros., Seattle, and Butterfield Bros., Portland. Following is a list of a few recent Howard clock installations on the Pacific Coast:

Arthur Letts Garage, Los Angeles; Baker county court house, Baker City, Ore.; Bank of San Jose, San Jose, Cal.; Boulder county court house, Boulder, Colo.; Fergus county court house, Lewiston, Mont.; library, Berkeley, Cal; Missoula county court house, Missoula, Mont.; Multnomah county court house, Portland, Ore.; Northern Pacific depot, Tacoma, Wash.; Pierce county court house, Tacoma, Wash.; Providence hospital, Seattle, Wash., Queen Anne High School, Seattle, Wash.; San Juan county court house, Silverton, Colo.; Seattle union depot, Seattle, Wash.; Snohomish county court house, Everett, Wash.; St. Mary's Paulist church, San Francisco, Cal.; Tacoma city hall, Tacoma, Wash.; Union depot and ferry house, San Francisco, Cal.; University of California, Berkeley, Cal.; Washington Hotel, Seattle, Wash.

THE FLOOR QUESTION

THE BANKING ROOM FLOOR

German Savings and Loan Society's Mission Branch, San Francisco. Herbert A. Schmidt, Architect.

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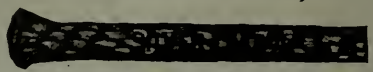

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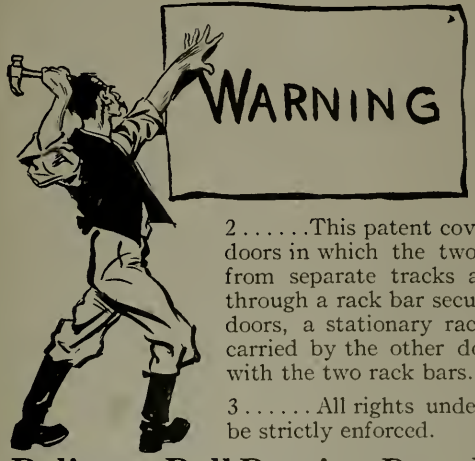

The Reliance Ball Bearing Door Hanger Co., is Owner of Letter Patents of the United States No. 756,321, dated April 5, 1904 for Elevator Doors.

2 . . . . . This patent covers all two speed doors in which the two doors are hung from separate tracks and are operated through a rack bar secured to one of the doors, a stationary rack, and a pinion carried by the other door and in mesh with the two rack bars.

3 . . . . . All rights under this patent will be strictly enforced.

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San Francisco's New Tunnels.

Since the plans of the Twin Peaks tunnel were completed the San Francisco city engineer has been bending all efforts on finishing the specifications for the Fillmore street tunnel.

The cost of the Twin Peaks tunnel is lower than was generally expected. This two and one-half mile single tube for street cars only will cost altogether but $3,994,000. The city engineer's estimate for the Fillmore street tunnel, which is only about three-fourths of a mile is $2,907,000.

The greater cost of the Fillmore street tunnel in proportion to length is due to the fact that it is a double tube tunnel providing not only for a double track car line, but also for vehicles of all sorts and a sidewalk. The Fillmore street excavation will be larger in all dimensions being 58 feet wide as against 25 feet in the Twin Peaks bore.

The successful beginning of the Stockton street tunnel, and the letting of contracts for 20 per cent less than the estimated cost is one of the most encouraging features of tube construction in San Francisco. The Stockton street tunnel is 1220 feet long and it was figured that the actual construction work would cost $434,000. Instead of this the work will be done for about $350,000. The land acquired and incidental expenses will be about $200,000 more.

If this same reduction is made in the Fillmore street tunnel, it will cost only about $2,250,000, and assessments on property throughout the district would be lower than has been expected.

The first tunnels in New York proved so successful that subway construction has been continued on a great scale, at a total cost of $200,000,000. Manhattan Island is now honey-combed with tunnels and all the suburbs are closely connected with the central part of the city. This has resulted in a tremendous rise in real estate value and an increase in the population and volume of business.

Hotel and Lodging House Law

Another new law, quite as drastic as that of the Tenement House Law, became effective August 10. It is termed the Hotel and Lodging House Act and deals exclusively with the building and occupancy of hotels and lodging houses in incorporated towns, incorporated cities, and cities and counties. The principal features of the Act are that provision must be made in the rear of a building for a yard with a depth varying from a minimum of twelve feet to ten per cent of the depth of the lot, if less than 120 feet deep, but never less than five feet, or if a corner lot a minimum of seven feet; unless the lot is less than 70

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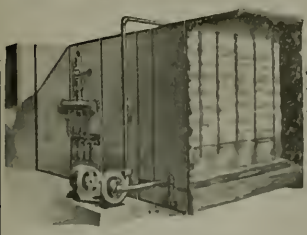

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feet in depth, but never less than a five-foot yard; corner lots of more than 75 feet in width to conform to the provisions of inside lots for the frontage above 75 feet.

Another provision of the act is that no windows are permitted to open on lot lines, but may open on lot line courts having a width of at least four feet. All alterations and additions to existing buildings must be made to conform to the act.

A Portfolio of Architectural Details

The Dahlstrom Metallic Door Company of Jamestown, N. Y., has just started to distribute free of cost to the architectural profession and others interested a portfolio of architectural details of hollow metal door and trim construction.

The value of steel interior finish for high-class buildings is being more and more appreciated by architects, builders, owners and managers. Extended information regarding the best practice in hollow-metal door and trim construction and its adaptability to varying designs, conditions and requirements is therefore timely and will serve a useful purpose.

The original drawings for these plates were made by men in the Dahlstrom organization under the supervision of Mr. Harry Wilson, and additional plates will be issued from time to time to show new developments in the art.

The portfolio will be sold to parties other than practicing architects at $5.00 each.

Contractor Not Obliged to Forfeit Bond Money

Judge Seawell has decided that the Thomson Bridge Company of San Francisco was entitled to the return of the $27,000 check which it put up with the California State Harbor Commission with its bid of $475,200 for the construction of Pier 37, together with an alternative bid, for a somewhat different class of work, of $482,700. The bid was prepared by J. H. Stack while Otto J. Crossfield, vice-president of the company was ill. The next lowest bid was that of the Healy-Tibbetts Company—$555,000, with an alternative bid of $562,000. When these figures were seen the Thomson Company went over its own figures again and discovered some mistakes. They then withdrew from the job and the harbor board sought to retain the check as a forfeit. Judge Seawell decided that the only forfeit that the board was entitled to was the one of $100 to pay for advertising for the bids.

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Some New California Building Laws

Among the new laws passed by the last legislature and which became effective on August 10 are the following:

Liens for Grading, Street Work, etc.

Section 1.—Section eleven hundred and ninety-one of the Code of Civil Procedure is hereby amended to read as follows:

1191. Any person who, at the request of the owner of any lot or tract of land, grades, fills in, or otherwise improves the same, or the street, highway, or sidewalk in front of or adjoining the same, or constructs any areas, or vaults, or cellars, or rooms, under said sidewalks, or makes any improvements in connection therewith, has a lien upon said lot or tract of land for his work done and materials furnished; provided, that in cases where the improvement made or work done is subject to acceptance by any municipal board or officer, the time for filing claims of lien shall not commence to run until after such acceptance shall have been made.

Scaffolding or Staging

Section 1.—All scaffolding or staging, swung or suspended from an overhead support which is more than twenty feet from the ground or floor, shall have a safety rail of wood or other equally rigid material of sufficient strength to bear any sudden strain there against equal to four times the weight of an ordinary man, such rail to be properly secured and braced in a manner to withstand a sudden strain as hereinbefore prescribed; such rail to rise at least thirty-four inches above the floor or floors or main portions of such scaffolding or staging, and extending along the entire length of the outside and the ends thereof, and properly attached thereto to withstand any strain as hereinbefore provided; and such scaffolding or staging shall be fastened so as to prevent the same from swaying from the building or structure, or place of work where such scaffolding or staging is being used. Any and all parts of such scaffolding or staging shall be of sufficient strength to support, bear, or withstand, with safety, any weight of persons, tools, appliances, or materials that may be placed thereupon or that are to be supported thereby while such scaffolding or staging is being used for any of the purposes thereof.

Sec. 2.—In addition to the duties imposed upon an employer by any law regulating or relating to scaffolding or staging, it shall be the duty of such employer who uses or permits the use of scaffolding or staging, as defined in section one of this act, in connection with construction, alteration, repairing, painting, cleaning or the doing of any other kind of work upon any building structure, or other thing or place of work, to furnish safety lines to tie all hooks and hangers back on the roof of such building, structure or other thing or place of work, and to provide safety lines hanging from the roof, securely tied thereto, and one such line to be provided between each pair of hangers or falls and near the ends of all such scaffolding or staging. When planks are used for the platforms or floors of such scaffolding or staging, they shall be not less than fourteen inches in width, and not less than one and one-half inches in thickness, and shall be of wood free from knots or fractures impairing the strength of such planks. Not more than two men shall be allowed or placed to work between two hangers or falls upon such scaffolding or staging.

Sec. 3.—Any violation of the provisions of this act shall be punishable as provided in section "four hundred and two c" of the Penal Code, and shall be in addition to the penalties provided therein for the violation of any of the provisions of the said section.

Sec. 4.—It shall be the duty of the commissioner of the bureau of labor statistics to enforce the provisions of this act.

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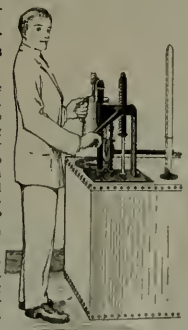
Then you wonder

Why a Bearing Becomes Loose

or the noise of the car increases, etc. Why not look to your lubricating oil storage for your car that costs so much more than your watch and needs the same careful attention? Isn't this worth your while.



But let us tell you more about this interesting subject. Write for descriptive literature.

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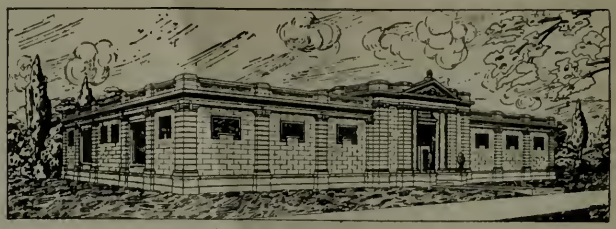

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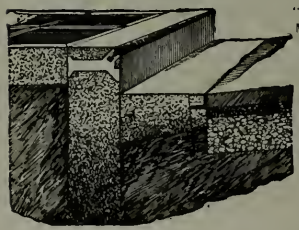

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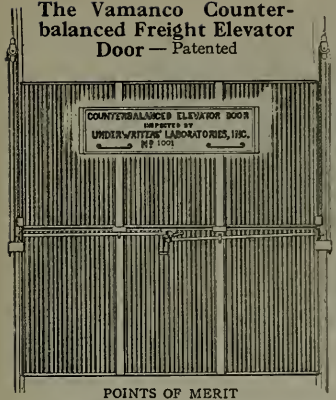

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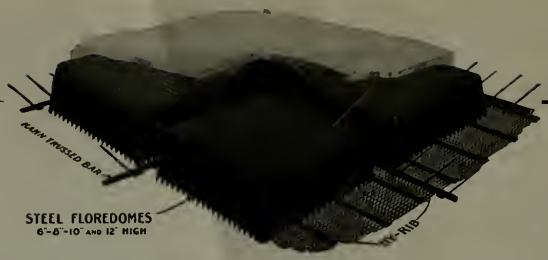

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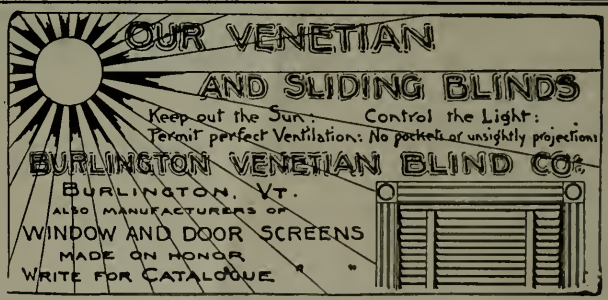

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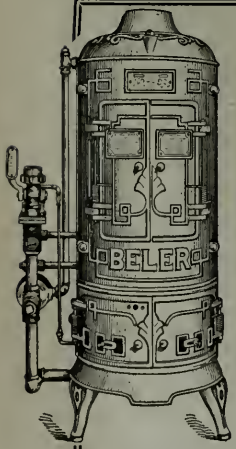

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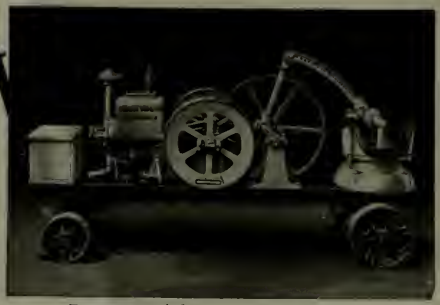

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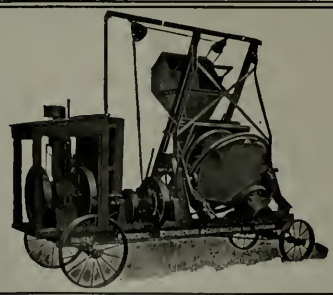

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About 150 members and friends of the Club accepted and were met at the Ferry Building by Mr. Gwynn, the firm's manager, who escorted the party across the Bay to Alameda. A special car was reserved for the Club, and the excursionists were taken direct to the works. Upon arrival there the party was welcomed by Mr. A. V. Clark and Mr. Phillips, the work's manager. Before inspecting the various departments connected with the making of architectural terra cotta and other clay products, the members were gathered together in the drafting department, where an interesting lecture was given by Mr. Phillips, and practical methods of the various stages of manufacture of architectural terra cotta were demonstrated by several of the employees of the firm.

Afterwards they dispersed for a couple of hours throughout the various buildings and viewed the plant and machinery.

Before leaving, the President of the Club, Mr. Harry E. Nye, made a few appropriate remarks and extended to Messrs. N. Clark and Sons a hearty vote of thanks.

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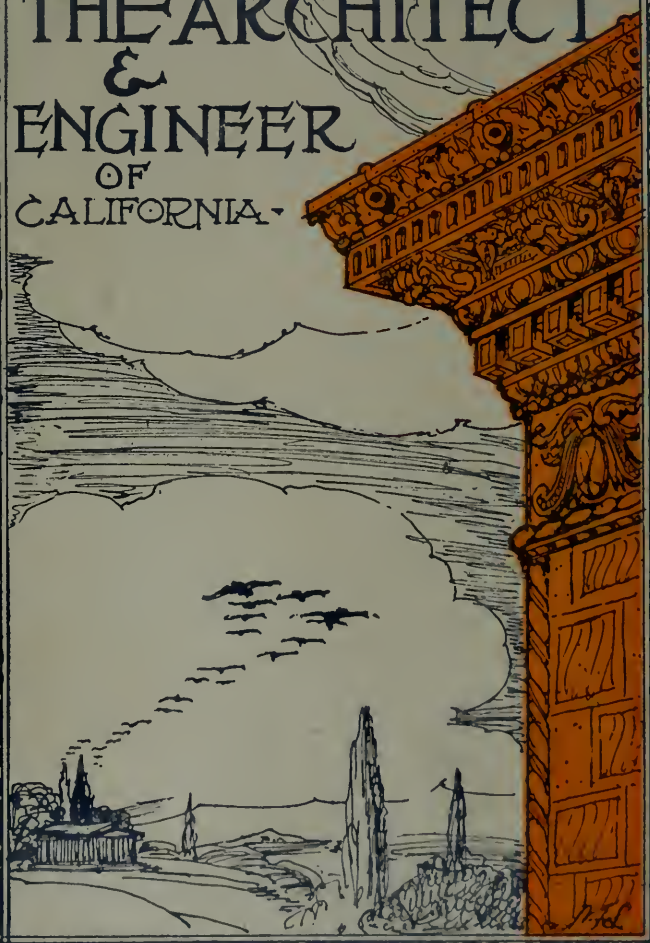

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DIXON'S SILICA GRAPHITE PAINT
BEST FOR STEEL SURFACE PROTECTION
JOSEPH DIXON CRUCIBLE CO., Pac. Coast Branch 155 Second Street SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT—Continued
The Building Material Co., "Medusa White Portland" ....583 Monadnock Bldg., S. F.

CEMENT EXTERIOR WATERPROOF COATING
American Paint & Dry Color Co., 560 Fulton St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See distributing Agents on page 153.]
Petrifax Cement Coating, sold in San Francisco by Sherman Kimball, 503 Market St.
Biturine Co. of America, 24 California St., S. F.
Hercules Waterproofing, manufactured by Hercules Waterproofing Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT EXTERIOR FINISH
American Paint & Dry Color Co., 560 Fulton St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing agents on page 153.]
Concrewaltum Paint, manufactured by Goheen Company, Canton, O. Coast branches, San Francisco, Portland and Seattle.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing Agents on page 153.]
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.

CEMENT GUN
Pacific Coast Gun Co..766 Folsom St. S. F.

CEMENT TESTS AND CHEMICAL ENGINEERS
Smith, Emery & Co....651 Howard St., S. F.
Robert W. Hunt & Co., 418 Montgomery St., S. F

CHURCH INTERIORS
Fink & Schindler.....218 13th St., S. F.

COAL CHUTES
Majestic Furnace Company, Sherman Kimball & Co., Inc.....507 Mission St., S. F.

CLOCKS—TOWER AND STREET
E. Howard Clock Company.....New York
For Pacific Coast agents see advertisement.

COOLERS AND HUMIDIFYERS
California Air Purifving Co., Monadnock Bldg.

CLOTHES DRYERS
The Hill-Canton Dryer Company, Canton, O.
Neponset Waterdyke Felt and Compound manufactured by F. W. Bird & Son, East Walpole, Mass.; sold by Parrott & Co., 320 California St., S. F.

COMPOSITION FLOORING
Fibrestone & Roofing Co., 704 Market St., S. F.
Lithoid Products Co., Merchants Exchange Bldg., S. F.

CONCRETE AGGREGATES
Dodge & Lathrop.....Rialto Building, S. F.

CONCRETE CONSTRUCTION
"Mushroom" System of Concrete Flat Slab Construction Industrial Engineering Co., Clunie Bldg., S. F.
Foster, Vogt Co.....Sharon Bldg., S. F.
Petersen, H. L. .....62 Post St., S. F.
Ransome Concrete Company, Oakland and Sacramento
F. J. R. Rickon.....1859 Geary St., S. F.
F. J. Klenck.....Sharon Bldg., S. F.

CONCRETE CURB GUARDS
Levensaler-Speir Corporation, 259 Monadnock Bldg., S. F.

CONCRETE MIXERS
Austin Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., the Beebe Company, Portland and Seattle, and P. B. Engh, Los Angeles.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., S. F.
Ransome Mixers, sold by Norman B. Livermore & Co.....Metropolis Bank Bldg., S. F.
Smith Mixers sold by Parrott & Co., San Francisco, Los Angeles and Portland.
Wallace Concrete Machinery Co., Monadnock Bldg., S. F.
Marsh-Capron Mixers, sold by Langford, Bacon & Myers, Rialto Bldg., S. F.
Koehring Mixer, sold by Harron, Rickard & McCone, San Francisco.

CONCRETE PILES
Harron, Rickard & McCone, Townsend Street, San Francisco.
Portland Concrete Pile Co., 754 Phelan Bldg., S. F.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

Specify... For Plastering
HOLMES DIAMOND SANTA CRUZ LIME
The Holmes Lime Co.
PHONE KEARNY 2220
Monadnock Bldg., San Francisco
Guaranteed Against Pitting or Popping

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle
Clinton Welded Reinforcing System, L. A. Norris, Monadnock Bldg., S. F.
"Kahn System," see advertisement on page 152 this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., S. F.
Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

CONCRETE BRICK AND TILE
Golden Gate Concrete Products Co., Inc. 404 Rialto Bldg., S. F.

CONCRETE CHIMNEYS AND SILOS
Delta Construction Co., 302 Forum Bldg., Sacramento Cal.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Liquid Stone Paint Co., Hearst Bldg., S. F.
"Concreta," sold by W. P. Fuller & Co., S. F.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
Moller & Schumann...1023 Mission St., S. F.

CONTRACTOR'S EQUIPMENT
Burt E. Edwards,....1025 Phelan Bldg., S. F.
C. H. & E. Mfg. Co., Inc., Milwaukee, Wis., represented by Parrott & Co., S. F., Beebe Co., Portland, A. F. George, Los Angeles, E. P. Jamison, Seattle.

CONTRACTORS, GENERAL
Commary-Peterson Co., Inc., 46 Kearny St., S. F.
F. J. Klenck.....Sharon Bldg., S. F.
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Foster, Vogt Co.....Sharon Bldg., S. F.
Geo. W. Boxton.....Hearst Bldg., S. F.
Holm & Son.....Foxcroft Bldg., S. F.
McLaren & Peterson.....Sharon Bldg., S. F.
Northern Construction Co., Mills Bldg., S. F.
Higginson Co., Inc., 804 Humboldt Bank Bldg., S. F.
Graham & Jensen....185 Stevenson St., S. F.
Ransome Concrete Co., 1218 Broad'y, Oakland
F. J. Rickon, C. E., 1859 Geary St., S. F.
Robert Trost....26th and Howard Sts., S. F.
Williams Bros. & Henderson, Holbrook Bldg., S. F.
Burt T. Owsley....311 Sharon Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal.
Ward & Goodwin.....Sharon Bldg., S. F.

CORK TILING
David J. E. Kennedy, Inc. Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., S. F.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Goheen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing, manufactured by Hercules Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Lithoid Product Company, Merchants Exchange Bldg., S. F.
Trus-Con Damp proofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F.
Liquid Stone Paint Co....Hearst Bldg., S. F.

DISAPPEARING IRONING BOARDS
F. G. Cox.....933 Phelan Bldg., S. F.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.
Richards-Wilcox Mfg. Co.,.....Aurora, Ill.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.
Wells & Spencer Machine Company, 173 Beale St., S. F.
Excelsior Dumb Waiters, manufactured by R. M. Rodgers Co., Brooklyn; M. E. Hammond, 217 Humboldt Bank Bldg., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

CALIFORNIA MARBLE

Seven Different Grades—Superior Finish—Moderate Price

Used in the New San Francisco Hall of Justice, Merchants Exchange Building Alaska Commercial Building, and others.

COLUMBIA MARBLE COMPANY

268 MARKET STREET, Rooms 201-202 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 704 Market St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRICAL ENGINEERS
Hicks & Folte.....320 Market St., S. F.

ELECTRIC HEATING
The Prometheus Electric Plate Warmer, M. E. Hammond, agent, Humboldt Bank Bldg., S. F.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., S. F.

ELEVATORS
Otis Elevator Company,
Stockton and North Point, S. F.
Spencer Elevator Company,
126 Beale St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co.,
593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
J. C. Hurley..... 12 Geary Street, S. F.
Hunter & Hudson.....Rialto Bldg., S. F.

EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices mfrd. by Vornegut Hardware Co. (see adv. for Coast Distributors).

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co.,
593 Market St., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vornegut Hardware Co. (see adv. for Coast Agencies).

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co.,
507 Montgomery St., S. F.
Levensaler-Spier Corporation,
259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., Head Bldg., S. F.
Gladding, McBean & Company,
Crocker Bldg., S. F.
Los Angeles Pressed Brick Co.,
Frost Bldg., L. A.
Roebling Construction Co., Crocker Bldg., S. F.
The Jackson Fireproof Partition Co. Levensaler-Spier Corporation, Distributors,
Monadnock Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLOOR VARNISH
Bass-Hueter and Works, S. F. Pioneer Varnish 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works,
Chicago, New York and S. F.
Moller & Schumann Co.,
1022 Mission St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co.,
704 Market St., S. F.
Mallott, Peterson & Adams,
682 Monadnock Bldg., S. F.

FORMS FOR CONCRETE
Metal form work, sold by California Sales & Supply Co.....San Diego

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit,
Bowser & Co. .....612 Howard St., S. F.

GARBAGE CHUTE
Bill & Jacobsen.....524 Pine St., S. F.

GLASS AND GLAZING
W. P. Fuller & Co.,
San Francisco, Los Angeles and Portland.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co.,
Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Dodge & Lathrop.....Rialto Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
Niles Sand, Rock & Gravel Co.,
Mutual Bank Bldg., S. F.

HARDWALL PLASTER
American Keen Cement Co, Levensaler-Spier Corporation, Representatives,
Monadnock Bldg., S. F.

HARDWARE
Pacific Hardware & Steel Co..S. F. and L. A.
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.
Window Adjusters, mfrd. by The Casement Co..... 175 State St., North Chicago, Ill.

HARDWOOD FLOORING
Strahle Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

WATER HEATERS - PUMPS
BOILERS

F. HARVEY SEARIGHT
SHREVE BLDG. SAN FRANCISCO

SPENCER ELEVATOR COMPANY
(FORMERLY WELLS AND SPENCER MACHINE CO)
126-128 BEALE STREET
TELEPHONE: KEARNY 664 SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD LUMBER
Parrott & Co.....320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co.,
First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater, sold by Thos. Thiehen & Co. .....667 Mission St., S. F.

LOCKERS
Keyless Lock Co.,.....Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa,
Western Division Office,
Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co.,
Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F.
J. C. Hurley..... 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
Monadnock Bldg., S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOSE RACKS AND REELS
Levensaler-Spier Corporation,
259 Monadnock Bldg., S. F.

HOTELS
The Angelus, Loomis Bros.....Los Angeles

HOLLOW BLOCKS
Atlas Stone Co.....663 Mission St., S. F.

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.

INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
418 Montgomery St., S. F.
Smith, Emery & Co. Inc.,
651 Howard St., S. F.

INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.

INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co.,
155 New Montgomery St., S. F.

LIME
Holmes Lime Company,
Monadnock Bldg., S. F.
Shasta Lime Products Company,
1550 Bryant St., S. F.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber Co. .....Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (see adv. on page 38 for Coast representatives).

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co.,
Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co.,
Pacific Bldg., S. F.
Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors,
Monadnock Bldg., S. F.
John Roebling Sons Co., Folsom St., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
Pratt Building Material Co.,
Hearst Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc.,
Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metallic Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.

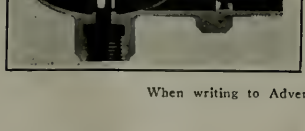
METAL FURNITURE
Dahlstrom Metallic Door Co., represented by M. G. West Co..353 Market St., S. F.
The Keyless Lock Co.....Indianapolis, Ind.
Van Dorn Iron Works Co.....Cleveland, O.
M. G. West Co.....353 Market St., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.....220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co.,
275 Connecticut St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co.,
349 Seventh St., S. F.
J. G. Braun.....Chicago and New York
Ralston Iron Works,
20th and Indiana Sts., S. F.
Standard Iron Works,
235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc.
19th and Minnesota Sts., S. F.



The Dunham Radiator Trap
Makes Good on Every Essential Point, Send for Catalog
Western Division Office
C. A. DUNHAM CO. - 602-18 Monadnock Building
SAN FRANCISCO PHONE SUTTER 2548

CONCRETE FLOORS MADE { WEAR-PROOF / DUST-PROOF / WATER-PROOF } at 2¼c Per Sq. Ft. with

May we tell you more about it?

ALLEN M. OLINGER, Dist.,

With WATERHOUSE & PRICE, SAN FRANCISCO, CAL.

METALCRETE

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE—Cont'd.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.

PAINT FOR BRIDGES
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Joseph Dixon Crucible Co., Coast branch, 155 Second St., S. F.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
American Paint & Dry Color Co., 560 Folsom St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Ad-el-ite paint, sold by Comyn-Mackall & Co., 310 California St., S. F.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors

PAINT SPECIALTIES
Comyn-Mackall & Co., 310 California St., S. F., agents for Ad-el-ite Paints.

PAINTS, OILS, ETC
American Paint & Dry Color Co. 560 Fulton St., S. F.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
R. N. Nason Company.....San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Moller & Schumann Co., 1022 Mission St., S F.
Berry Bros.....250 First St., S. F.
Paraffine Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.

PAVING BRICK
Vallejo Brick & Tile Co., 343 Sansome St., S. F.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRAPHY
R. J. Waters Co.....717 Market St..S. F.
Walter Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation....259 Monadnock Bldg., S. F.
"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.
Herman Bosch.....4420 20th St., S. P.

PLUMBING
Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Colemao.....706 Ellis St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.....1001 Monadnock Bldg., S. F.
Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

POWER PLANT EQUIPMENT
F. Harvey Searight...817 Shreve Bldg, S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company.....San Francisco, Seattle, Portland and Los Angeles

RADIATORS
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.
Langford, Bacon & Myers. Rialto Bldg., S. F.

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton, Sts., S. F.
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Mallott, Peterson & Adams, 682 Monadnock Bldg., S. F.
Grant Gravel Co.....Williams Bldg., S. F.
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy, Monadnock Bldg., S. F.
Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
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United Materials Co.... Balboa Bldg., S. F.

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Universal Safety Tread Co., represented by Waterhouse and Price, San Francisco and Oakland.
Mason Safety Tread—See advertisement on page 123 for Coast agents.

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Kohler Co.....Menadnock Bldg., S. F.

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Capitol Sheet Metal Works, 1927 Market St., S. F.
Yager Sheet Metal Co.....Oakland, Cal.
Olive, Cox & Leary....345 Eighth St., S. F.
Western Furnace & Cornice Co., 1645 Howard St., S. F.

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Olive, Cox & Leary.....145 Turk St., S. F.

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Judson Manufacturing Company, 819 Folsom Street, San Francisco.
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Mortenson Construction Co., 19th and Indiana Sts., S. F.
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Pacific Rolling Mills, 17th and Mississippi Sts., S. F.
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U. S. Steel Products Company, Rialto Bldg., S. F.
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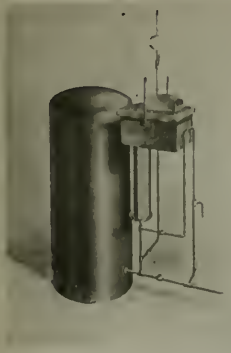

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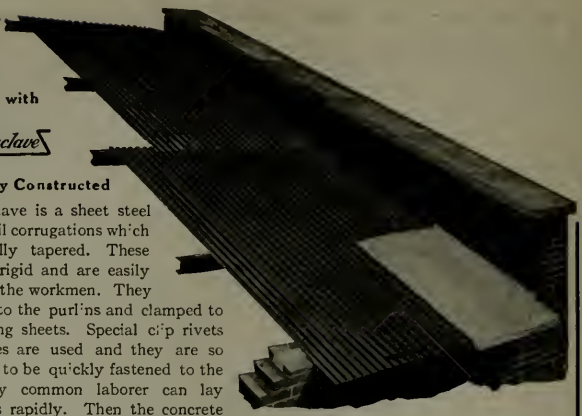

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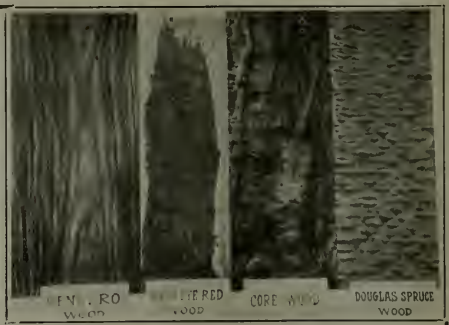

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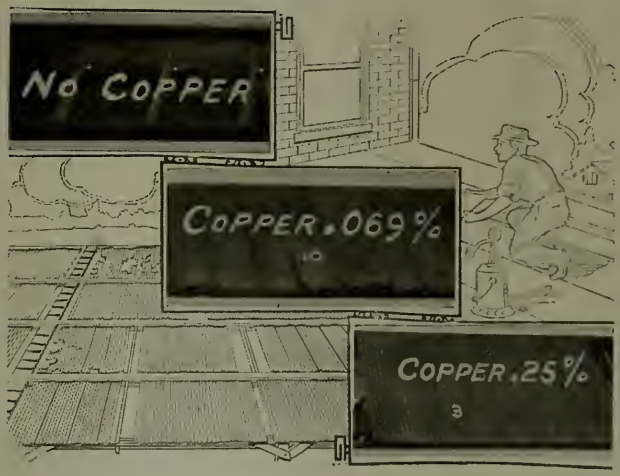

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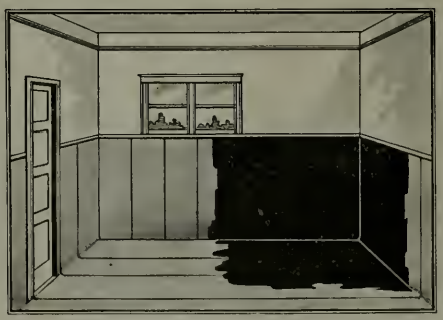

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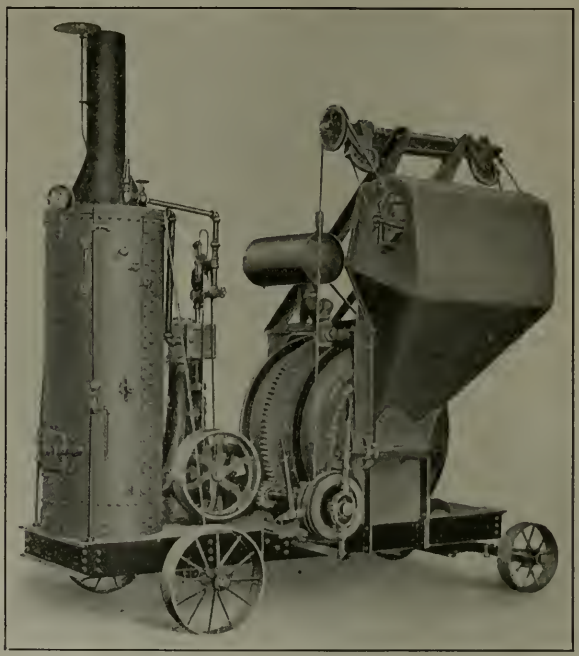

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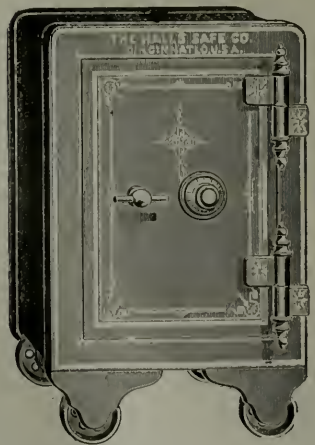

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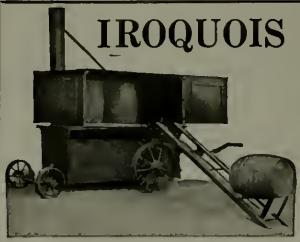

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BUILDING FOR MR. W. H. O'BEAR, SAN FRANCISCO
Milton Lichtenstein, Architect

Frontispiece
The Architect and Engineer
of California
for September, 1913.

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XXXIV. SEPTEMBER, 1913. No. 2

House for Mr. Jules Klein, San Francisco
Milton Lichtenstein, Architect

A Few Notes on Some of the Recent Work of Milton Lichtenstein, Architect

IN this number of The Architect and Engineer is shown some of the recent work of Architect Milton Lichtenstein of San Francisco. The buildings which Mr. Lichtenstein has designed reflect thorough training and appreciation of the several schools of architecture, with a partiality for the French and Italian. A native of San Francisco, Mr. Lichtenstein received his education in the local schools and then at the Massachusetts Institute of Technology. After extensive travel in Europe he became identified with the firm of Warren & Wetmore of New York City and it was while in the office of this well known firm of architects that the plans were prepared for the great Hotel Belmont. Upon returning to the Pacific Coast Mr. Lichtenstein entered the employ of Messrs. Bliss & Faville, remaining with them until September, '08, when he commenced to practice for himself.

One of the largest and most interesting buildings that Mr Lichtenstein has designed is the S. & G. Gump hotel at Geary and Jones streets. This structure is seven stories high and contains one hundred rooms so arranged that all of them have an outside exposure with abundant light and air.

Cement Exterior Residence Flats for Messrs. B. B. and E. R. Golland, San Francisco
Miltan Lichtenstein, Architect

Apartments for Hilda Lee and Lucy Pilger, San Francisco
Milton Lichtenstein, Architect

Residence Flats for Mrs. Carrie A. Greenberg, San Francisco
Milton Lichtenstein, Architect

Residence of Mr. Felix Kahn, San Francisco
Milton Lichtenstein, Architect

Hotel for S. & G. Gump Realty Company, San Francisco
Milton Lichtenstein, Architect

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Brick Building for Mr. B. H. Lichtenstein, San Francisco
Milton Lichtenstein, Architect

Apartments for Mr. Joseph E. Levin, Sacramento Street near Van Ness Avenue, San Francisco
Milton Lichtenstein, Architect

The design is French Renaissance, and is said to be one of the most frequently copied buildings in San Francisco.

Flats for Mr. Francois Marx, San Francisco. Milton Lichtenstein, Architect
Class C Building for Mr. B. H. Lichtenstein, San Francisco

This design is an English plaster treatment with tile mansard roof and vitrified brick entrance steps.

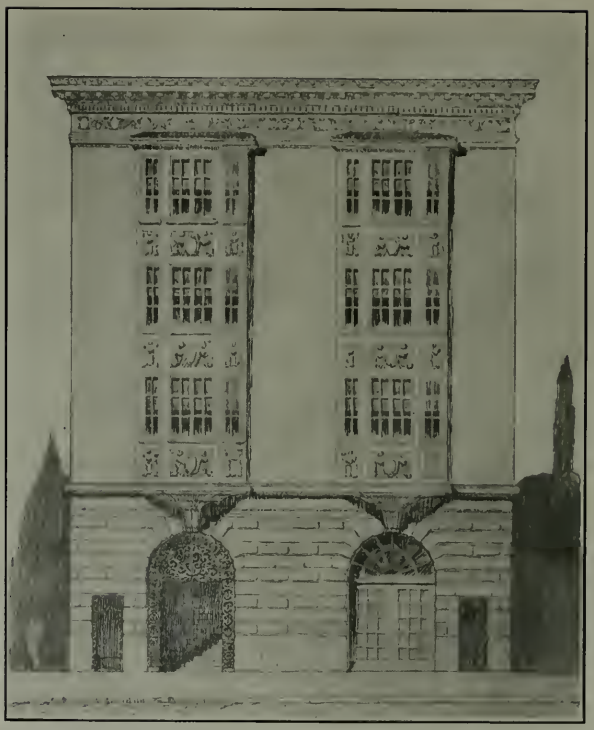
Interior of Marx Flats, looking into the Living Room from the Reception Hall

House of Mr. Sol B. Goldberg, San Francisco
Milton Lichtenstein, Architect

Flats on Cherry Street, near Sacramento, San Francisco
Milton Lichtenstein, Architect

The cost of the building exceeded $100,000. The construction is steel frame and reinforced concrete walls.

In the Heyman Jacobs apartment house Mr. Lichtenstein has worked out a problem of providing a big city structure with all the conveniences and comforts of a private home. A feature is an open court, 32x25 feet, where the occupants may gather and enjoy the pleasures of a garden and lawn with its cement walks, fountains and stone furniture. The Italian style has been followed both in the design of the house and the court.



Apartment House for Mr. Hyme Jacobs, San Francisco
Milton Lichtenstein, Architect

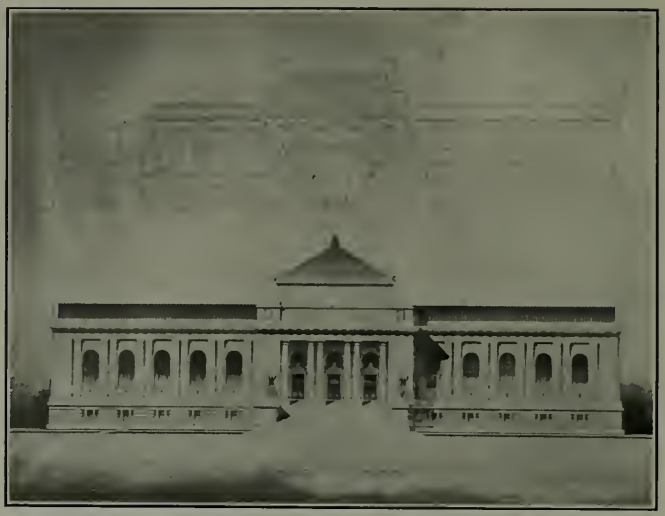
Away up in the bleak country of Wells, Nevada, which is some 600 miles from San Francisco, there is a one-story bank building that Mr. Lichtenstein designed with the idea in view of making it proof against robbery and theft. The building is constructed of reinforced concrete, including floors, walls and roof. The windows are of wire plate glass and metal sash with 1⅛-inch Crome steel bars for additional protection. Inside, the bank screens are made of bullet-proof steel mesh calculated to withstand a fusilade of shots from a battery of .38 and .44 calibre automatic guns such as are used by the western highwaymen. The bank has been built now for nearly three years and is still the object of interest to the natives as well as the newcomers.

Mr. Lichtenstein has participated in a number of competitions and has on several occasions been awarded prizes and mentions. In the San Francisco City Hall competition he was awarded a prize of $1,000. In the Washington State Capital competition his design was given second men-

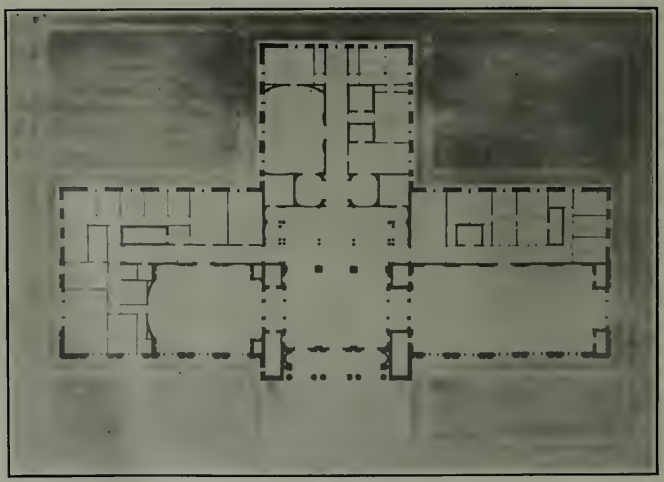
Class "B" Reinforced Concrete Building for Mr. B. H. Lichtenstein, San Francisco

Milton Lichtenstein, Architect

Duplex Flats for Mr. Fred W. Shell, Jordan Park, San Francisco

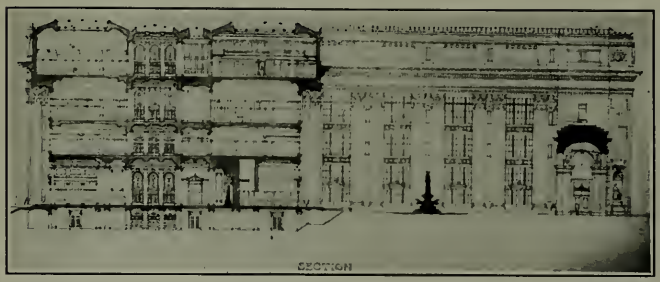


Competitive Design for Supreme Court and Law Library, Olympia, Washington, Awarded Second Mention
Milton Lichtenstein, Architect

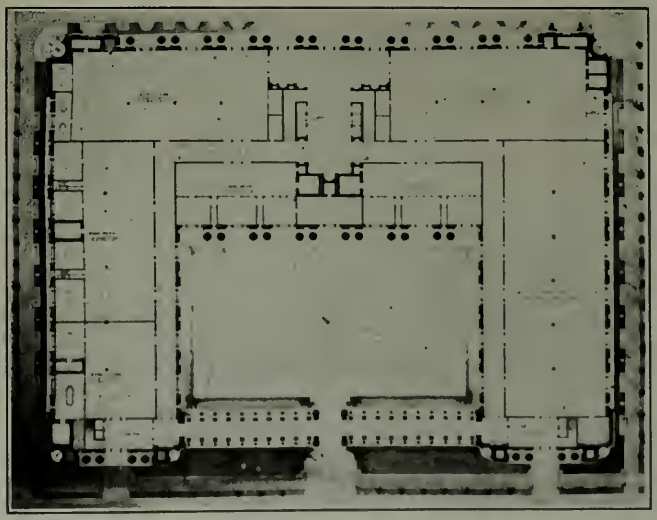


First Floor Plan, Supreme Court and Law Library, Olympia, Washington

Competitive Design for San Francisco City Hall, Awarded a Prize of $1,000
Milton Lichtenstein, Architect



Section, San Francisco City Hall



Floor Plan, San Francisco City Hall

Bullet-proof Bank at Wells, Nevada

tion, while in the Olympic Club building competition in San Francisco third prize was awarded him.

Mr. Lichtenstein is a member of San Francisco Chapter of the American Institute of Architects, and is also a member of the Masonic order and the Kappa Theta fraternity. He is 31 years old and one of the youngest practicing members of the profession in California.

* * *

Ode to the Draftsman

By E. A. VAN DEUSEN in Engineering News

Ah, what a life
The draftsman leads
In this glad world today;
He draws his plans,
He draws his breath,
He draws also his pay.
His working hours
Roll swiftly by
When he deserves a "raise;"
His thoughtful brow,
Is thoughtful more
As increase meets his gaze,
He fills his pen,
Then draws a line,
And knows that things are fair,
And swears, "I'll keep
This good old job
And work it on the square.
I'll hold my mind
Down to my task,
The blessed live-long day;
That boss of mine
Can never claim
I haven't earned my pay.
The boss expects
Me not to know
All things from A to Z,
But just to do
My utmost best,
And work efficiently.
Creative task
So satisfies,
That life is not a bore;
I'll 'beat it' home,
And in the morn
Gladly come back for more."

The Relation Between the Architect and the Contractor

By JOHN C. AUSTIN, Architect, Los Angeles

THE relations that existed between an architect and an electrical contractor a few years back were very unsatisfactory for several reasons —the first being that most architects did not know the rudiments of electricity, and as a consequence had to rely on the knowledge of the electrical contractor, and generally the one who submitted the lowest bid (owners seldom accept any other). The man submitting the lowest bid is not always an embryonic Edison; very often he is a financial fool who has simply counted up the number of outlets, and guessed what it would cost to give a result that would pass the inspection of the architect (who was, as I said before, densely ignorant of the subject) for the smallest amount possible.

After the contract was awarded and the work was started, the contractor's assumed profits began to look microscopically small, so he would then invade some kindergarten and employ labor from that source. He would watch these students work (somewhat as Tom Sawyer watched his playmates paint the fence), and then when it was done, he would apply for his certificate. The architect would then inspect the work, make a few kicks for form's sake, and then issue the certificate; saying that the work was all right, but not saying anything about the beneficent Providence which in most cases looked over it all and gave both architect and contractor the benefit of the doubt.

Another cause of trouble was the practice pursued by some architects of letting the contract for electric wiring to a general contractor, who would then have to sub-let the wiring and other electrical work to an electrical contractor. The general contractor would always feel bound to let the electrical work to the man who could string the most wire for the least money; this, on the face of it, was a poor method as money was the one gauge by which everything else was measured.

It is obvious that an architect cannot master every branch of electricity any more than he can master all of the technical details of plumbing, painting, stone-masonry, and the numerous other items which are necessary to complete the modern building. The wise architect (and he is generally over thirty), when he has an important building to undertake, will consult with experts in every important branch, and in so doing he will get in touch with the latest appliances and will have a specification that, when it is read, will not bring a smile to the face of the one who knows. It goes without saying that a carefully prepared set of plans and specifications in which nothing is left to the imagination will give the owner what he wants at a reasonable figure and the contractor will be able to figure a profit.

The demands for electrical apparatus are so numerous and important that the work of an electrical contractor should be independent of that of the general contractor, and he should be treated as an original contractor instead of as a subcontractor. When an architect lets all of his so-called subcontracts to what is known as a general contractor, he is simply trying to save trouble to himself; and in saving himself the immediate trouble, he is not conserving the interests of his employer (the owner), but is breeding trouble and consequent dissatisfaction for every one concerned.

The general contractor knows nothing about electricity; then why should he be employed, and why should the owner pay a double profit?

By a double profit, I mean profit for the electrical subcontractor and the other profit being for the general contractor who is supposed to shoulder all responsibility, which responsibility generally consists in figuring a large amount for the wiring and sub-letting it for the smallest amount possible without reference to quality.

Since the electrical contractor has assumed such importance, and since there is in every town an association of master electricians, I think it would be a wise move for each association to have a committee of experts upon whom the architects could call for advice. In the event of trouble and dispute this committee could be called upon to state in an impartial way whether the electrical contractor had fulfilled honorably and fairly the terms of the contract, or whether he had slighted the work. This committee should be composed of men who would render a decision without fear of their colleagues or of the architect.

In the event of the committee finding that the electrical contractor was doing "shoddy" work, then this contractor should be punished, and possibly expelled from the association. When the architects found that the association stood only for straight, honorable, and efficient work, and that the dishonest practitioner would have no place in its ranks, then a membership in such an association would be of great value to its members, and one would think seriously before venturing on transgressing its rules.

I know that it might be said that there would be collusion between the members; but if there was collusion, it would soon leak out, and the association would have done more damage to the cause of uplifting the business of electrical contractors than the few dollars gained by collusion could do good; and the the association would soon be a thing of the past.

In a large city this organization could save vast amounts in the following way: Almost every manufacturer sends out samples of the goods he has to sell to the architects, who in a great many cases promptly lose them; and when they find them again, wonder what on earth they are for, as the literature that came with the samples has been relegated to the waste basket.

If the association could arrange to receive samples and to classify them, the architects would get into the habit of visiting its headquarters from time to time for the purpose of education. Usually the "drummer" manages to call when the architect is immersed in something else; and while the goods that he represents will be of the utmost importance at some future time, the matter is pushed aside for the more pressing needs of the present. If samples of all electrical appliances were filed at the headquarters of the association after the architects had seen them, they would then go there for full particulars when the need became a pressing one.

The manufacturers could pay a small fee for the privilege of filing the samples of their goods with the association; and in doing so they could be sure that their samples were not either stowed away in a cupboard where they could not be found, or lost entirely. These fees could be used to defray the rent and secretary's wages.

The time of the specialist has come in every walk of life, and the expert electrical contractor will have to be recognized as a specialist and as an independent contractor by every architect and owner.

* * *

Architect — "Were there many doctors at the consultation?"
Friend — "Oh, not so many—only about a hundred thousand dollars worth.".

A Park View of the Bryson Apartments

Los Angeles the Home of Many High Class Apartment Houses

By FREDERICK JENNINGS

WHY is it that Los Angeles builds better apartment houses than San Francisco? Why do San Francisco architects spoil an otherwise fireproof building by tolerating wood floors and joists when, for a few hundred dollars additional, they could use concrete or hollow tile?

Here is one architect's answer and others will tell you the same thing: "We would make all our buildings fireproof. Many an architect starts out with good intentions, but when the owner finds the building is going to cost more to have fireproof floors and partitions, he directs us to 'cut out' the hollow tile or metal lath, eliminate the concrete floors and substitute wood for the metal trim—just to save a few hundred dollars."

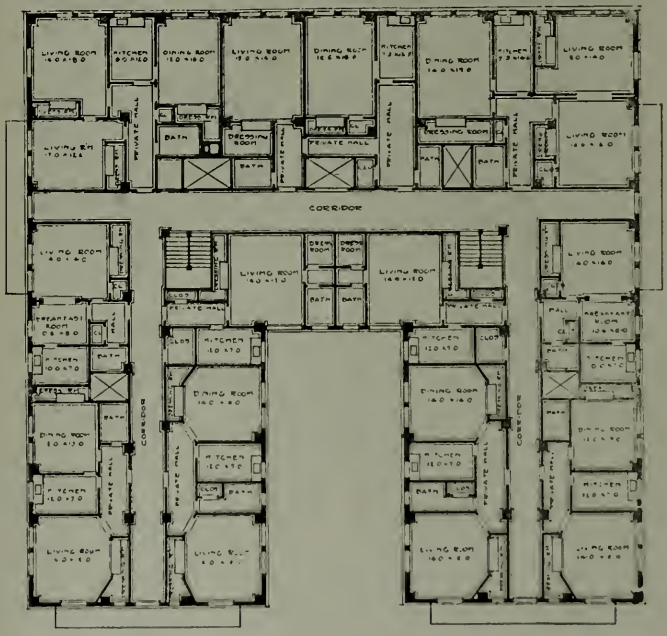
But to return to our opening interrogation: Why is it that Los Angeles builds so well? One reason is that the building regulations there are more sweeping than in other coast cities. Another reason is the liberality of the owners who possess sufficient foresight to appreciate the fact that the better the construction the easier it is to secure assistance from the banks. Good construction also means lower insurance rates and a higher rental income.

An example of Los Angeles liberality and enterprise in apartment house building is to be found in the three wonderful structures that have been put up by the F. O. Engstrum Company for Mr. F. O. Engstrum, Mr. F. E. Engstrum and Mr. Hugh W. Bryson. When it was announced that these men contemplated the erection of great modern apartment houses on lines similar to the big structures of New York City, there were many skeptical people who declared such a considerable investment was short-sighted business judgment; in other words, they doubted if the city was large enough to support them. It has since been demonstrated, however, that the promoters had backed their financial investment of $1,500,000 with a lot of sound judgment—the senior Engstrom was never known to miscalculate a business opportunity—for all three buildings are today taxed to their full accommodations and the owners are realizing handsomely on their investment. So successful, in fact, has been their venture that other buildings are being planned for the very near future

Rex Arms Apartments, Los Angeles, the Most Completely Equipped Apartment House on the Pacific Coast. Note Garage Annex on the Left
F. O. Engstrum, Owner. Paul C. Pape, Architect

It is interesting to note that in building the owners have not only built well but have embodied in their plans everything that tends to add to the comfort and convenience of the occupant, the idea being to satisfy the tenant so he will be permanent. There are a lot of conveniences an owner can provide if he will unloosen his purse strings. But the trouble in most cases is that he prefers to spend his money on the appearance rather than in the comforts of the building. In the Rex Arms apartment house at 745 Orange street, the final word in apartment house construction would seem to have been said. Not only is this building fireproof throughout, being of the reinforced concrete type, but it possesses features and conveniences found in no other similarly constructed building in the world that we know of. The building was designed by Architect Paul C. Pape in accordance with suggestions and ideas of the owner. It is eight stories high and occupies a lot 75x200 feet. It contains 96 apartments of two and three rooms each with private tile baths, both phones, magnificent ball

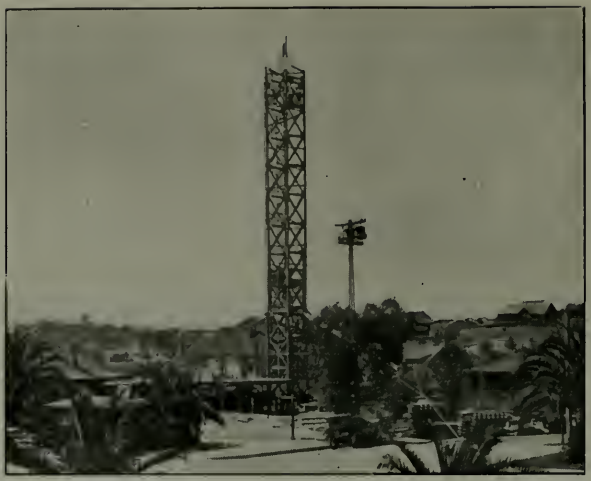
room, billiard room, large, elegant lobby, fast elevator service, vacuum cleaning plant, roof garden, filtered water system, incinerators, grocery store feature and last, but not least, a private garage for the exclusive use of patrons of the house. How many owners would use up ground space, 50x221 feet, just to provide garage room for their tenants? The accompanying photograph shows how artistically the garage idea has been carried out, the structure being set back so as not to clash with the architectural beauty of the main building facade. The entrance to the garage is in the center, while on either side are green plots of grass inclosed by a low cement wall. The front is painted light grey and two bronze



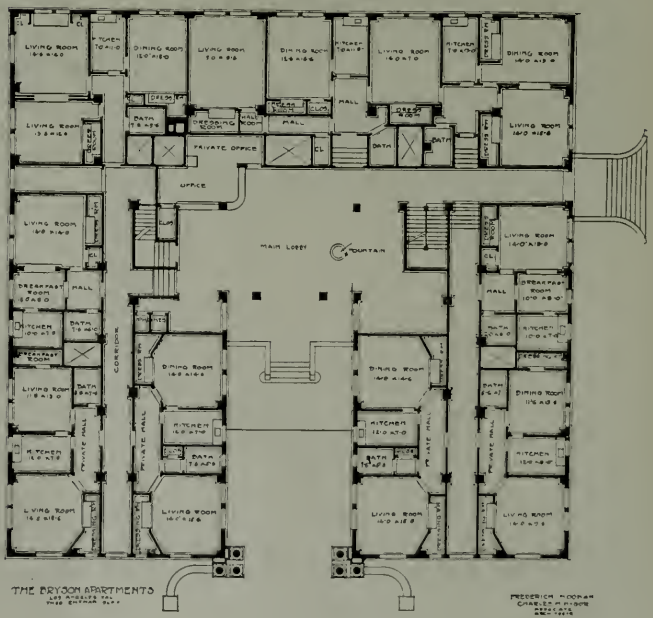
Typical Floor Plan of the Rex Arms and Bryson Apartments

electroliers set off the driveway and provide ample light at night. The grocery store, already referred to, is located in the basement of the apartment house and is in charge of an experienced grocery man. It has proved a most convenient and profitable experiment. Like the garage feature, it originated with Mr. F. O. Engstrum, who has come to be recognized as the man of authority in modern apartment house construction on the Pacific Coast.

The other two buildings illustrated herewith are very similar in design and construction to the Rex Arms apartments. They are called the Westonia apartments, R. B. Young & Sons, architects, situated on West Fifth street, between Olive and Grant, and owned by Mr. F. E. Engstrum;



G. Y. Gravity Tower used for Pouring Concrete on all Three Buildings



-FIRST FLOOR PLAN-

Bryson Apartments Under Construction

and the Bryson apartments, situated on Wilshire boulevard and Rampart street, and owned by Mr. Hugh W. Bryson. Noonan & Keysor were the architects.

All three buildings used the Kahn system of reinforcement, also each of the buildings adopted the Marshall & Stearns folding bed. The Concrete Appliance Company's G-Y System of delivering concrete was used and many exceptional runs were made on each of the three buildings, all of them being put up in record time. The Rex Arms and Bryson apartments were completed and furnished in a fraction less than eight months, from date of excavation.

Each building is owned by individual members of the F. O. Engstrum Company. All believe in modern methods of substantial building construction in preference to class C or cheap construction. This judgment has proved wise from a financial standpoint being recognized by bankers and the investing public generally.

To furnish the 320 rooms which each of these great apartment houses contain costs more than it would cost to furnish just double that number

Bryson Apartments, Los Angeles. Noonon & Keysor, Architects

of hotel rooms with equipment anywhere near equal. Herewith is published a table of contents of a three-room apartment, which will accommodate up to four persons. The three rooms that are scheduled are the combination living and bedroom, the combination dining and bedroom and the kitchen. In addition there are two small dressing rooms, a very large hall, a bathroom and three closets. All of the woodwork is of brown mahogany in the living rooms, and of white enamel finish over cedar in the dressing rooms, bath and kitchen. The floors are all hardwood or of tile. The finest kind of plumbing fixtures are used in the baths, with a shower attachment for those who desire this style. The tubs are set into the wall and floor and the cupboards, medicine chest and towel holder are built in. The equipment of each apartment consists of the following:

Kitchen Utensils

	No.
Tea kettles	1
Rice boiler	1
Sauce pans	3
Dish pan	1
Colander	1
Pudding pan	1
Milk pan	1
Pie plate	1
Cake pan	3
Coffee pot	1
Egg separator	1
Gem pan	1
Grater	1
Tea pot	1
Flour sifter	1
Tea strainer	1
Bowl strainer	1
Sink strainer	1
Chopping bowl	1
Rolling pin	1
Salt box	1
Dust pan	1
Drip pan	1
Funnel	1
Egg beater	1
Cake turner	1
Wire fork	1
Potato masher	1
Ice pick	1
Egg whip	1
Can opener	1
Asbestos mats	2
Scrub brushes	2
Lemon extractor	1
Biscuit cutter	1
Mincing knives	1
Table mats	1 set
Garbage cans	1
Cuspidors	1
Hall boy jugs	1
Carpet sweeper	1
Bread board	1
Knives	1
Forks	1
Nickel silver table spoons	2
Nickel silver tea spoons	2
Nickel silver forks	2
Paring knife	1
Butcher knife	1
Ironing board	1
Casserole	1
Aluminum spider	1
Aluminum omelet pan	1
Aluminum mixing spoon	1
Aluminum griddle	1
Bread box	1
Sugar canister	1
Coffee canister	1
Tea canister	1

Kitchen Furniture

Four-burner range	1
Ice box	1
China closet	1
Table	1

Linen

	No.
Sheets	4
Spreads	2
Pillow cases	4
Table cloths	2
Napkins	6
Face towels	4
Bath towels	4
Tea towels	4
Huck towels	4
Scarfs	1
Squares	1
Doilies	1
Shoe bag	1
Floor mop	1
Duster	1
Bath mat	1
Pads	2

China

Dinner plates	6
Dessert plates	6
Salad plates	6
Soup plates	6
Bread and butter plates	6
Platters	2
Cups—Tea	6
Cups—After dinner	6
Cups—Bouillon	6
Saucers—Tea	6
Saucers—After dinner	6
Saucers—Bouillon	6
Saucers—Fruit	6
Vegetables—Covered	1
Vegetable—Open	2
Tea pot	1
Creamer	1
Sugar	1
Gravy boat	1
Mayonnaise bowl	1

Glass

Tumblers	6
Goblets	6
Cruets	2
Syrup jug	1
Bowl, 1-inch	1
Celery	1
Jelly	1
Wine glasses	6
Champagne glasses	6
Water pitcher	1
Creamer	1
Sugar	1
Salt	1
Pepper	1
Finger bowls	6
Vase	1
Inkwell	1
Candlesticks	2
Penholder	1
Desk pad	1

Furniture

Disappearing wall beds	2
Turkish rocker	1
Upholstered rocker	1
Upholstered chair	1

-TENTH FLOOR PLAN-

THE BRYSON APARTMENTS

Kitchen Furniture—Continued.

	No.
Chairs	2
Built-in cooler	1
Built-in sink	1

Hall Furniture

Hat rack	1
Coat rack	1
Telephone chair	1

Silver

Knives	6
Forks	6
Butter knives	6
Table spoons	3
Tea spoons	12
Dessert spoons	6
Bouillon spoons	6
A. D. coffee spoons	6
Sugar tongs	1
Crumber	1
Pie server	1
Carving set (4 pieces)	1
Ladle	1
Pickle fork	1

Furniture—Continued.

	No.
Couch	1
Davenport	1
Desk	1
Desk pads	2
Taborette	1
Dining table (W. & M.)	1
Dining table (Colonial)	1
Dining chairs (W. & M.)	6
Dining chairs (Colonial)	6
Library table (W. & M.)	1
Center tables	2
Flag seat rocker (W. & M.)	1
Flag seat chair (W. & M.)	1
Fireside chair	1
Sideboard (W. & M.)	1
Side table (W. & M.)	1
Mattresses	2 to 4
Rugs	2 to 4
Mats	2
Waste baskets	2
Clothes hamper	1
Carpet sweeper	1
Ironing board	1
Table lamp	1

The furniture is all of mahogany, solid, and not the veneered variety. The upholstering is done in leather and silk velours. The rugs are of imported German weave, after Oriental patterns. There are several lighting fixtures, including chandeliers, the wall lights and a wall socket for attaching desk lamp, electric iron, fan or other electrical contrivances, thus doing away with the danger of attachments to the ordinary lighting fixtures.

The Marshall & Stearns Company oscillating portal wall beds are used throughout the house. They are attached to one large door, are of full width and are the most agreeable of all disappearing beds, allowing as they do, for excellent springs and the use of a regulation sized mattress. They disappear in the closets and allow considerable space for clothes

Westonia Apartments, Los Angeles, Fred E. Engstrum, Owner
R. B. Young & Sons, Architects

or other storage that may be desirable. Their action is such that any woman can handle them with ease.

The kitchen equipment is more elaborate than found in most homes. Granite ware and aluminum have been used exclusively in the pots and pans, as well as in the utensils where the latter metal is possible. The range is one of the features of the place. It has four burners, a large bake oven, warming shelves and pilot lights for slow continued heating. The refrigerator is of the best variety, white enameled throughout

The bath room is perfectly appointed. Tile has been used on the floor, and on the walls to the six-foot line. Handsome nickle plumbing fixtures, including the shower arrangements are used throughout. The medicine

chest is well arranged and of cedar wood. A bin for used towels and other soiled linen is part of this built-in feature.

The dressing room is finished in white enamel and contains sixteen drawers of varying sizes for wardrobe use. A French plate mirror sets in the center of the upper drawers and allows for excellent dressing table. All of the drawers are of cedar, moth, mouse and possibly even fool proof. Another set of drawers for table linen, silverware and other necessities is located in the hall between the bath and dressing rooms. Lowrie wall safes built into the wall are installed throughout, for the protection of the valuables of guests and to do away with the tiresome and odious storage system in the general vault of the main office.

The hall leading into the apartments has a wall rack and a standing coat hanger. The double telephone system is used and a special table, built for the phones and for the telephone books is a handy feature. A chair to match is included. There are other small devices throughout which help the guest in living easily and with discomforts all removed. Daily cleaning of the rooms, making the beds, washing the dishes, placing clean linens is included in the service.

Most interesting in the apartment house business is the amusement feature which apparently must be furnished guests to keep them satisfied. No matter how small the apartment at the present time, it will at least have a ball room and a roof garden. One entire floor has been devoted to this feature and it has been a revelation to the hotel men who have inspected it. The accompanying floor plan will explain itself as far as arrangement of the ball and banquet room, kitchen, smoking, billiard, ladies' dressing and writing and reading rooms is concerned. The loggias on four sides of the house surpass by far the ordinary roof garden and are furnished with excellent outdoor, weather-proof furniture, swings, easy rockers and observation chairs. Potted trees and shrubs lend attractiveness.

The reading room is furnished in white wicker, set off by old rose hangings, cushions and handsome Oriental rugs. Original paintings by well known artists are hung here as well as throughout the upper portion of the house.

The ladies' writing room is in a pastel apple green, with dainty colonial furniture. The dressing room is in French gray and pink with a dressing table in white enamel, and pier mirror extending across the room. The billiard room has the Brunswick-Balke-Collander equipment in two of the best tables made. The smoking room is finished in brown, the furniture being in heavy Turkish leather. A lavatory in tile and marble adjoins.

The reception room is a work of artistry. Magnificent Oriental rugs cover the floor. The furniture is of heavy mahogany, upholstered in a rich mahogany brown. A wonderful old Steinway with a timbrel of the harp occupies an important position. An immense fireplace stands majestically at one end of the room. The ball room adjoins. Splendid paintings are hung in this room and a stage is set at one end. A large kitchen with ranges and a pantry filled with sufficient equipment to serve a four hundred plate banquet is located off the ball room, which can and has been set for dinner parties. The silver service is as extensive as that found in a hotel kitchen.

These things will given an idea of what a real apartment house stands for, the amount necessary to equip one and the service that goes with it. The office is located on the first floor, a part of the lobby. This lobby is handsomely furnished and in the same excellent taste displayed throughout the house. The entire lower, or semi-basement floor is given over to

servants' quarters, to laundry room, storage rooms, children's amusement hall and dancing room, linen room and other necessary features for the operation of so extensive a place.

The elevator machinery, vacuum cleaning machinery and similar plants are located outside of the house proper, having a small structure all of their own, thus avoiding all possible annoyance from noise.

* * *

Terra Cotta Walls

NEARLY all builders are familiar with hollow tile for fireproofing large steel frame buildings, but terra cotta is something quite different, and used without a framework of steel. In short, terra cotta hollow tile are specially designed and manufactured blocks which take the place of bricks, stone or other like materials in the walls and partitions of a building. They support the floors and roof just as other walls do, but they do far more than that and far more than other building materials, and these different functions are what we want you particularly to notice.

Everybody knows that air cells make the best possible insulator against the passage of heat. Terra cotta hollow tile divide the walls up into a multitude of air cells, and these cells prevent the passage of heat through the wall from outside to within, or from within to outside. As a result, any building having walls of hollow tile is warmer in winter than buildings of other materials, for the heat generated by the heating apparatus within is not dissipated from the walls of the building; while in summer weather the house built of hollow tile is cooler than any other, because the heat of the sun beating down on the walls cannot penetrate to the interior. The economy of hollow tile walls follows as a natural consequence of the non-passage of heat. The conductivity of walls is one of the great heat problems of the heat engineer, more heat being required to keep the walls warm than to heat the interior.

But hollow-tile blocks are not the only kind of building materials which resist the passage of heat. Stone and brick walls do likewise, although not to so great an extent. Stone and brick walls, however, while they prevent to a certain extent the passage of heat, very freely conduct water into the building. Capillary attraction and the solid nature of the walls are the causes leading to this result. With terra cotta hollow tile, on the other hand, there is no capillary other than that necessary for the holding of mortar; even if there were, the air cells formed in the wall by the partitions in the hollow tile would prevent any moisture whatever from reaching the interior of the building. This difference between walls of solid masonry and those of hollow tile can be seen by examining the furniture in houses built of the different materials. In a stone wall building you will find that the keys in the piano stick after the house has been shut up without heat for a few days. In a terra cotta hollow tile home, heat can be shut off indefinitely without any evidence whatever of dampness becoming apparent. This saving of furniture, together with the saving of fuel and saving on insurance will go a long way toward making hollow tile buildings the cheapest as well as the best type of building in the long run.

A feature of home building which heretofore has received but scant attention from architects and builders, but which is of prime importance to the owners or occupants of a building, is perfect privacy in the home. What is more annoying to sensitive persons than a home, hotel or other building, for that matter, where there is no privacy? When anything is said or done it is telegraphed all over the building by the frail-lathed partitions acting as sounding-boards.—Construction News.

The Protection of Concrete Structures From Alkali and Other Destructive Agents*

IT is now several years since the destructive effects of alkali on concrete structures was pointed out by Mr. Tannant, Rural Engineer, Montana, and althougth his predictions and experiments were received with derision at the time by both engineers and cement manufacturers this destruction has been forcibly brought to the attention of the engineering profession on many projects throughout the West. Concrete culverts and substructures have either failed or been dangerously weakened where the concrete has been in contact with either alkali waters or soil containing alkali; and there is a strong possibility that his prediction of the destruction of several dams in the West from this cause will soon be an acknowledged fact.

It is not the writer's intention to go into the physical or mechanical action of alkali on concrete; indeed the subject has been fully discussed in the various engineering journals for the past four years, and beyond the conclusion that dense concrete as well as concrete well water-proofed, offered the greatest resistance, there have been no results attained. These recommendations only afforded the manufacturers of various water-proofing compounds an additional opening to exploit their wares, with the result that the destruction still goes merrily along.

In all probability alkali has been made the scapegoat for many failures to which it contributed very little, for as we shall shortly see there are many other causes tending to this destruction. All soft waters, such as rain water and snow water, owing to the presence of considerable carbonic acid, are ruinous to any cement, containing lime in any shape or form, the destruction being of course proportional to the lime content of the cement. The carbonic acid leaches out the lime, forming calcic bicarbonate, with the result that as soon as the lime content is sufficiently poor the structure fails. This action can be easily seen in sidewalks where the rain water is allowed to fall from the eaves on the concrete. In less than a year the upper skin is abraded and the concrete soon becomes a mass of gravel. It may be mentioned, however, that where a top coat of sand and cement is used this destruction is considerably delayed.

In connection with the above, the following quotation taken from a paper by Professor A. Stutzer and R. Hartleb, M. D., published in the "Zeitschrift fur Angewandte Chemie," will be of interest:

"We have had occasion to examine a cement taken from reservoirs where it had remained in connection with water for eight or nine years. The cement had grown poorer and poorer in lime, and was converted into a soft, brownish mass, while its proportion of ferric oxide and alumina had increased. We concluded that the carbonic acid in the water had gradually dissolved the lime with formation of calcic bicarbonate, and are still of that opinion. On closer analysis a co-operating cause appears in the action of bacteria in the lime."

Now, it is a well-known fact that all of the western reservoirs and canals are holding and conveying waters impregnated with decaying vegetation and bodies of dead animals, which increase the carbonic acid and bacteria content of the waters and undoubtedly contribute to the destruction of all concrete structures in these waters.

Distilled water or, in other words, pure water, is another "bete noir."

* W. D'Rohan, Irrigation Engineer, Denver, Colo., in Engineering & Contracting.

Professor H. McCloud has furnished the following notes of an investigation of some cements. A Portland cement containing

	Per cent.
Soluble silica	19.15
Lime	62.8
Alumina	7.86
Magnesia	1.04
Ferric oxide	2.76
Sulphuric acid	2.06
Insoluble silica	3.6

was finely ground and shaken with distilled water for six days; 40.5 per cent of lime was dissolved, 38 per cent being dissolved in three days only. Some of the same cement was mixed with water, allowed to set, and kept in water for three days. It was then powdered and shaken with water for three days, when about 32 per cent of the lime was dissolved.

A block of hardened cement, of unknown composition, 3x3x2 ins., which had been kept in water for 3¼ years, was broken, some of the exterior and of the interior was finely powdered and shaken with distilled water for 11 days. From the exterior 26.5 per cent of lime was dissolved, and from the interior 27.6 per cent. The exterior contained 4.5 per cent of carbonic acid, and the interior 3.1 per cent.

A briquette which had been tested at seven days after making, and probably had not been kept in water, was examined 3 1-3 years afterwards. Portions were powdered and shaken with distilled water for 11 days. From the interior portion 36.3 per cent of lime was dissolved and from the exterior 23.4 per cent. The interior contained 1.1 per cent of carbonic acid, and the exterior 8.7 per cent.

Experts are all agreed, however, that all of the destructive causes of cement, whether arising from sea water, sewage, gases, alkali, and others, are entirely due to their action on the lime, ferric oxide, and alumina in the cement. Slag cement being high in silica, and low in lime and ferric oxide, would apparently offer a panacea, and the manufacturers taking advantage of this tide of public opinion in their direction, immediately boosted their prices and advertised their cements as resisting alkali. A great many engineers of western projects, ignorant of the fact that any kind of slag cement is only suited for subaqueous work and rapidly deteriorates when subject to periods of wetness and dryness, paid the extra charge without demur, only to find no appreciable difference between their high priced purchase and ordinary Portland cement.

One of the oldest structures with which the writer is acquainted, in which slag cement was used, is the breakwater and pier about 850 feet long on an exposed portion of the Yorkshire coast, England, at Skinningrove Iron Works. The monolithic mass has so far withstood all attacks of the sea, and though built in 1886 the portion under the water has acquired a hard durable surface, which resists attrition, and also any decomposing action. Above water the skin has become white and is less satisfactory than ordinary Portland cement in a similar situation.

The superiority of cements highly silicious over aluminous cements is unquestionable. M. Beid of le Teil Department of Ardeche, France, is confident that the addition of dehydrated clay is the only known means at present of resisting decomposition. Mr. C. G. Potter has shown that the addition of six parts of calcined red brick clay added to the clinker while grinding greatly increased the resistant powers of cement to all influences. He also further experimented with over-burnt, well-burnt

and under-burnt clays, and found the best results came from the under-burnt clay.

In fact it may be claimed that all cements resist alkali in degrees varying with their composition, but there is no cement at present manufactured that does so effectually. Iron ore cement may be the exception, but whether from diffidence or want of funds it is not well advertised nor well known in this country.

Pozzulana cements are credited with very high resisting powers, and justly so. In this connection the writer gave several formulas for their manufacture in a paper published in Engineering and Contracting for August 24, 1910. The article was the subject for some caustic editorial comment, but the increasing use of pozzulans in this country has produced an entire change of front. All of the examples cited are of old and tried cements, and any one of them makes a better alkali-proof cement than the commercial Portland; and they possess this advantage that they can be easily and cheaply manufactured right on the job, and by common labor.

The decomposition of concrete mortars by rain water and other causes was fully recognized in Europe and England many hundreds of years ago, and various additions were made to the concrete, all designed to counteract this destruction; bullock's blood, rye-dough, barley water, beer, eggs, buttermilk and earth being added with various results. The accounts of the repairs to the steeple of Newark Church in 1571 has this entry: "6 strike of malt to make mortar to blend with the lyme, and temper the same, and 350 eggs to mix with it." On the continent, in 1840, Mr. Fred Kuhlmann exploited silica of soda and cement, and silicate of potash.

The Indian practice of painting concrete with a mixture of two parts boiled linseed oil, with one of raw linseed oil is the only one to save existing concrete from alkali, and indeed from all other destructive agencies. Mineral oils being subject to softening from the effects of gases are not as successful as vegetable oils. The linseed oil will also, by preventing the oxidation of the sulphides in slag cement, save the latter from decomposition from any source whatever.

This remedy is not new. It has been used in India for over 50 years, and it also forms the base of nearly all of the waterproofing compounds made in this country. It is applied when the concrete is about six months old, in the form of a point, and should be renewed every five years. Formerly concrete was supposed to need no attention after the forms were removed, but that is a mistake. Concrete while not needing the same attention as wooden structures, nevertheless should be carefully watched, and examined every year. It is also advisable that where the structure is to be backfilled, the filling should be postponed as long as possible, and the concrete sprinkled every day; and painted with the linseed oil mix when the backfilling becomes compulsory.

It is absolutely necessary to use highly silicious cements with no free lime, and with the use of oil as above recommended slag cement is the most suitable, especially for the subaqueous portion of the structure, but the part exposed to the air should be always of good sound Portland cement.

If possible, water entirely free from alkali should be used in the mixing. This can be acquired by boiling the water, but it is found that water containing from 1 to 2 per cent of alkali has a beneficial effect by hastening the hardening of the concrete. In fact the Germans add a certain quantity of alkali, either soda or potash, depending on the amount already contained in the cement-clay, but enough to bring the amount to 3 or 4 per cent of

the whole for the purpose of forming a soluble silicate to act upon the lime in setting and sometimes a small amount of finely pulverized sand or quartz rock is added.

The washing of the sand is another dispensable luxury, as it has been conclusively shown that 15 per cent of clay or loam increases the density of the mix without any appreciable depreciation of strength.

Slag cement, while usually made from blast furnace slag, can also be made from smelter and other slags, and the large number of smelters in the West offer wide fields for exploitation, more especially by the harassed irrigation engineer who is trying to put up substantial structures with meager capital. For his benefit it is necessary to point out that furnace or any slag slowly cooled in the air possesses no hydraulic properties. In this shape it is known as "ortho-calcium silicate." To impart hydraulic properties to such slag it must be converted to decalcium silicate by suddenly chilling the slag in cold water, the colder the water the higher the hydraulic properties imparted. The water granulates the molten slag, and about 40 per cent of each individual grain becomes strongly hydraulic. When molten slag is chilled in lime or other alkali water the slag will absorb the alkaline properties of the water and become strongly hydraulic. Molten slag, however, chilled in cold milk of lime will become hydraulic in the highest degree, and when ground will in tensile and compressive strength equal Portland cement. This milk of lime is made by using two parts of lime by weight to 100 parts of slag, and is commercially known as the Canaris process.

In the Grau process a jet of super-heated steam is projected on fused slag in such a manner that the slag falls into a state of powder and forms a pile which is allowed to cool slowly in order to prolong the effect of heat and steam.

In the process of Dr. Heinrich Colloseus of Berlin, the molten slag is allowed to fall slowly on a rotating drum which serves to split it up into small particles. Magnesium sulphate (common Epsom salts) is sprayed on it through the drum.

Other processes use salts of barium, or strontium, salts of calcium magnesium and aluminum.

All of these cements have to be finely ground before using.

* * *

For Beautifying Canal

The report of the Fine Arts Commission, which was charged with the preparation of plans for the beautification of the Panama canal, has been completed and will be transmitted to Congress through President Wilson. The plans embody landscape effects to make artistic the approaches to the canal, as well as the locks and country through which the big ditch has been cut. As far as possible the commission proposes to preserve existing beautiful landscapes and to supplement them by planting of additional trees.

The preliminary report was drafted by Daniel C. French, chairman of the commission, and Frederick Law Olmsted, who went to the Canal zone as a special committee. Their recommendations were afterward considered by the entire commission and the report will be laid before President Wilson as soon as all of the members have signed it.

Insurance Exchange, San Francisco
Willis Polk & Co., Architects

INSURANCE EXCHANGE
THIS BUILDING WILL BE READY FOR TENANTS OCTOBER 1ST 1913
FOR UNRESERVED SPACE APPLY TO BALDWIN & HOWELL
EXCLUSIVE RENTING AGENTS 316-24 KEARNEY ST.
AS PER FOLLOWING
SCHEDULE OF CONSTRUCTION
CONTRACTOR
WILLIS POLK AND COMPANY
ARCHITECTS
MANAGERS OF CONSTRUCTION

Unique Blackboard upon which was Noted the Progress Made by Each Contractor

Architect Uses Blackboard to Hold Contractors to Their Schedule

WILLIS POLK & COMPANY are the first Pacific Coast architects to introduce the blackboard idea showing the progress that the contractor is making on the job. The above plate is produced from a photograph of the blackboard in front of the Insurance Exchange building, a 12-story class A structure just completed on California St., San Francisco, in record time. The entire work was performed by segregated contracts and the time allowed each contractor to complete his part is indicated by a heavy white line. If an extension of time is allowed through avoidable delay, a red line is drawn above the schedule which lets the public know who is responsible for delays. Naturally, the contractor wishes to avoid such notoriety as it does not tend to strengthen his reputation, hence he exerts every effort to finish his part of the job on time. The building was started last September and it is now practically ready for occupancy, being completed according to schedule and without any material interruption.

Polytechnic High School, Santa Ana. *Withey & Davis, Inc., Architects.*

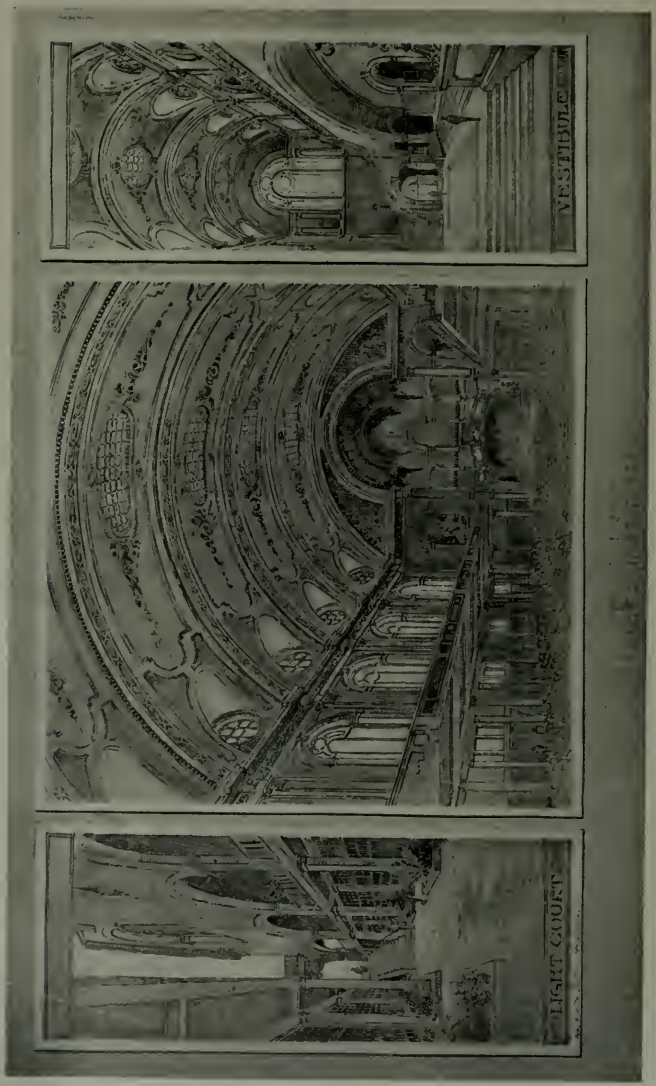
Some Examples

of

Ecclesiastical Architecture

in

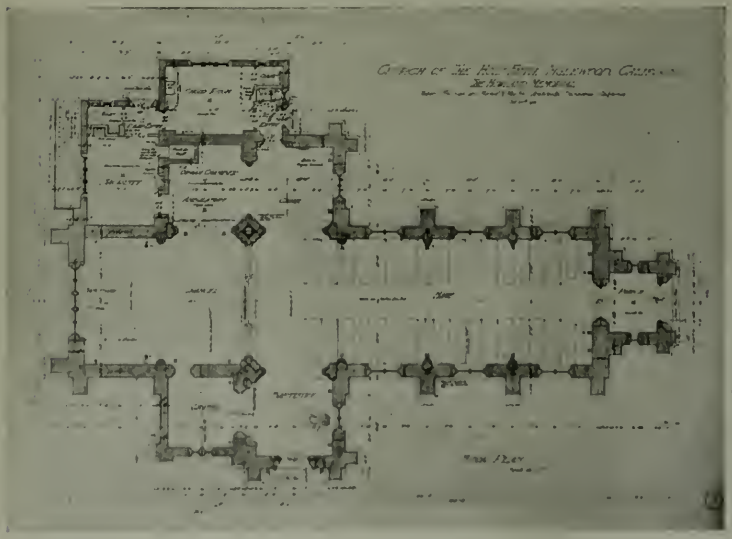
Southern California



Bible Institute, Los Angeles.

Walker & Vawter, Architects

Church of the Holy Faith, Inglewood
Herbert Frohmon and Harold H. Martin, Architects



Church of the Holy Faith, Inglewood—Floor Plan
Herbert Frohman and Harold H. Martin, Architects

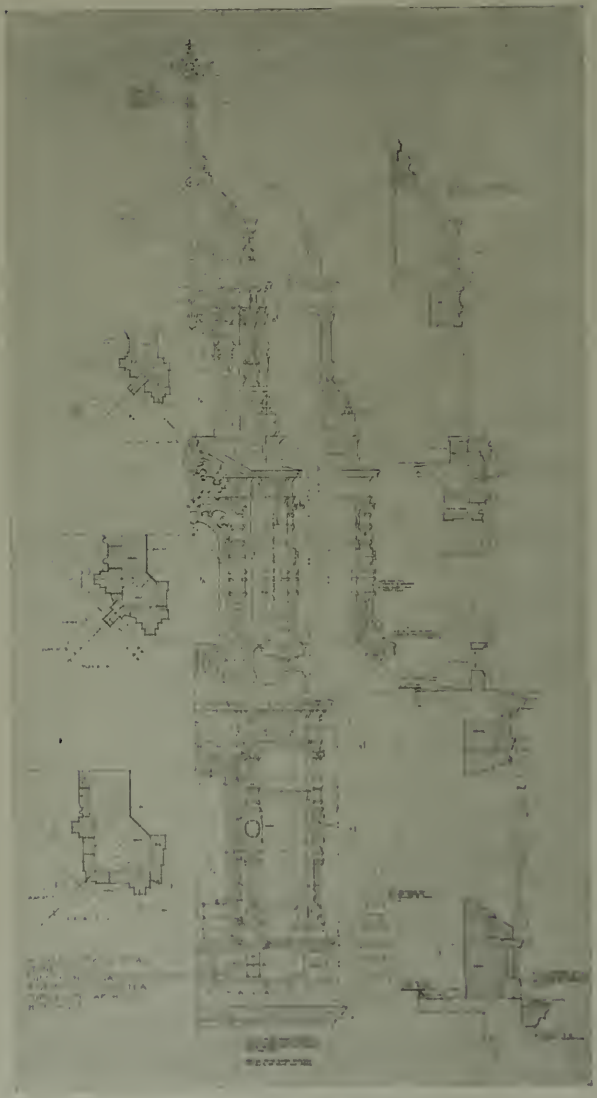
Sketch for Proposed French Catholic Church *Fernond Pormentier, Architect*

First Baptist Church, San Diego *Norman F. Marsh, Architect*

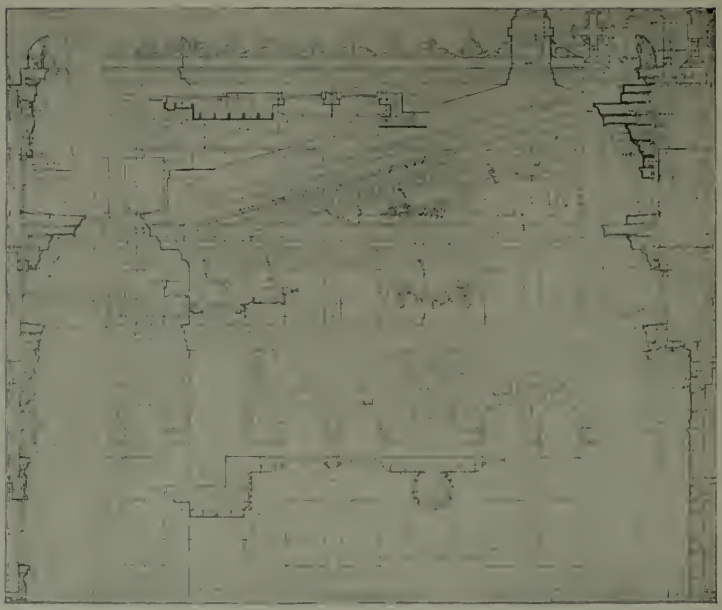
Pilgrim Congregational Church, Pomona
Robert H. Orr, Architect. Ferdinand Davis, Associated

Mary Andrews Clark Memorial, Los Angeles
Arthur B. Benton, Architect

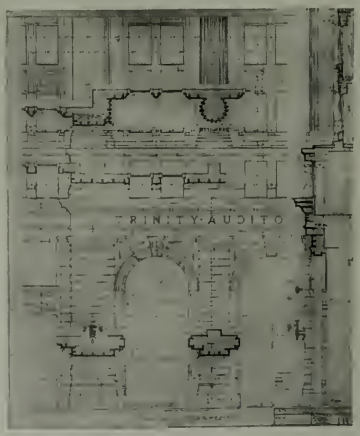
Mary Andrews Clark Memorial, Los Angeles
Arthur B. Benton, Architect



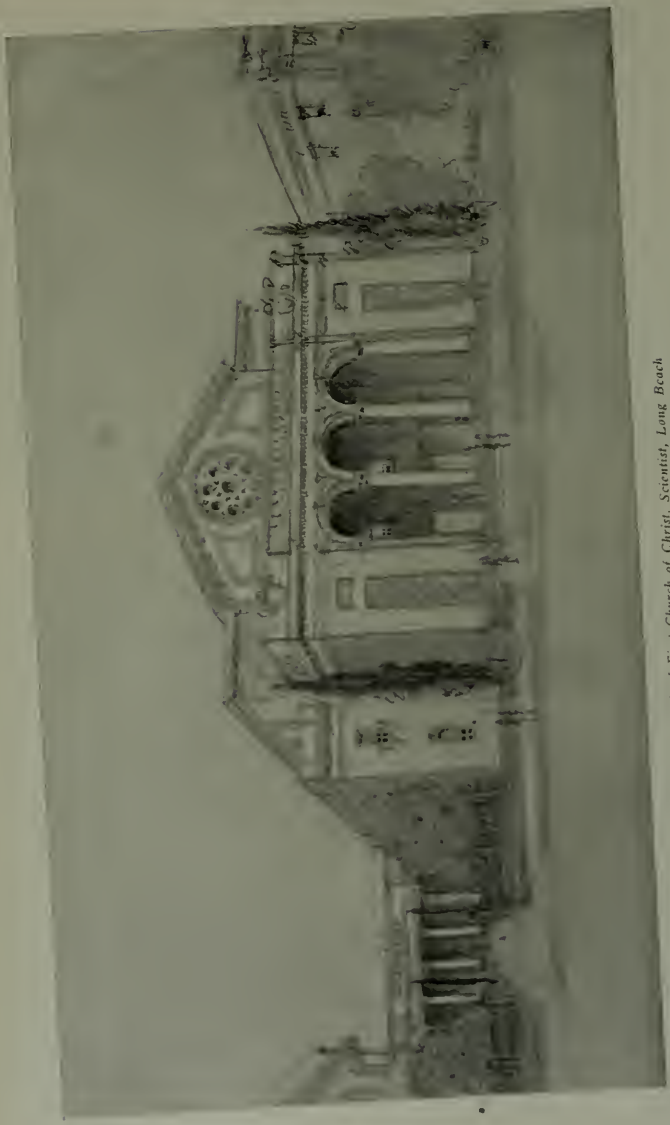
First Congregational Church, Riverside—Lower Detail
Myron Hunt, Architect



Trinity Auditorium Building, Los Angeles—Scale Detail
Fitzhugh, Krucker & Deckbar, Architects



Scale Detail—Trinity Auditorium Building, Los Angeles
Fitzhugh, Krucker & Deckbar, Architects



Sketch of First Church of Christ, Scientist, Long Beach
Elmer Grey, Architect

Sketch of First Church of Christ, Scientist, Long Beach
Elmer Grey, Architect

View of Cloisters—Plaza Church Rectory, Los Angeles
Albert C. Martin, Architect

Bond Feature of the New California Lien Law Unconstitutional?

IN the Los Angeles Superior Court Judge Craig has handed down two decisions on demurrers of the American Surety Co. of New York, in the Thos. Darling case, which are interesting in the different views the court takes of the present mechanic's lien law and the fifty per cent bond to laborers and material men.

In one case the court passes upon the constitutionality of Section 1183 of the lien law, requiring the bond, and rules that in this feature the law is unconstitutional. The case will probably be appealed to the Supreme Court at once, and will be the first instance where the constitutionality of the law will be put before the highest court for final decision.

In the other case, in which suit is brought upon the same bond and against the same defendants, the legality of the bond under the common law was established, the basis of the pleading being the bond itself and not the provisions of the mechanic's lien law.

In the case first mentioned, that of Chas. J. Collier vs. J. M. Thomas, J. C. Crawford, Thos. Darling and American Surety Co., to foreclose a lien for $56.21 for painting materials furnished for a three-story apartment house at Santa Monica by Collier to J. C. Crawford, a subcontractor under J. M. Thomas, the attorneys for the American Surety Co. demurred to the complaint on the grounds that "the law does not and cannot require a bond to be given under and by virtue of a building contract, such as the one sued upon herein." The bond was in the amount of $6640, or fifty per cent of the contract price. The opinion of Judge Craig in this case was as follows:

"This is an action on a bond which according to the allegation of the complainant, was given by the American Surety Company under the provisions of Chapter II, Title IV, Part 3, of the Code of Civil Procedure. Under this express declaration on demurrer we cannot treat the instrument in question as a common law bond. That a statute which requires a contractor for the erection of buildings to secure his contract by a bond is unconstitutional in that it undertakes to make a discrimination not founded upon a natural, inherent or constitutional distinction, is well settled by the case of Shaughnessy et al vs. American Surety Co., 138 Cal., 543, and other decisions.

"It is equally well established that no law can place a liability beyond the contract price upon an owner who has on his part complied with all of the terms of a valid contract. Stimson Milling Co. vs. Braun, 130 Cal., 122, and other cases referred to in defendant's brief.

"It is clear that the present mechanic's lien law compels the owner to require the contractor to furnish a bond which he cannot be compelled to do, or be liable to the lienholders in an amount in excess of the contract price. This appears to be a necessary conclusion. The statute provides: 'The liens in this chapter provided for shall be direct liens, and shall not in the case of any claimants, other than the contractor, be limited, as to amount, by any contract price agreed upon between the contractor and the owner, except as hereinafter provided.' Further on Section 1183 declares other exceptions by which the owner may limit his liability as to liens to the amount of the contract price to be as follows: 'In case said original contract shall, before the work is commenced, be so filed, together with a bond of the contractor with good and sufficient sureties in an amount not less than fifty (50) per cent of the contract price named in said contract, which bond shall, in addition to any conditions for the performance of the contract, be also conditioned for the payment in full of the claims

of all persons performing labor upon or furnishing materials to be used in such work, and shall also by its terms be made to inure to the benefit of any and all persons who perform labor upon or furnish materials to be used in the work described in said contract, so as to give such persons a right of action to recover upon said bond in any suit brought to foreclose the liens provided for in this chapter, or in a separate suit brought on said bond, then the court must, where it would be equitable so to do, restrict the recovery under such liens to an aggregate amount equal to the amount found to be due from the owner to the contractor and render judgment against the contractor and his sureties on said bond for any deficiency or difference there may remain between said amount so found to be due to the contractor and the whole amount found to be due to the claimants for such labor or materials, or both." In case no bond is furnished as above provided Section 1183 makes the owner's property liable to liens "for the reasonable value of the labor done or material furnished, or both," etc.

"Our Legislature has attempted to do what the Supreme Court has declared under our constitution cannot be done, namely, to provide a lien upon the owner's property in excess of the contract price where the owner has executed a valid contract and has on his part complied with it, but the mechanic's lien law under which this action is brought has attempted to obviate the necessity of the owner's property being so bound by providing for the bond as above quoted. Also on that subject we find the following: 'It is the intent and purpose of this section to limit the owner's liability, in all cases, to the measure of the contract price where he shall have filed or cause to be filed in good faith with his original contract a valid bond with good and sufficient sureties in the amount and upon the conditions as herein provided.'

"It therefore appears that the Legislature has attempted to make constitutional a provision, void as to the owner, by permitting one party to the contract, to execute a bond which such contractor cannot be required to furnish and which 'running to nobody and enforcible by anybody who in the future could bring himself within its range,' our Supreme Court has strongly intimated it does not consider any sane man would execute except under compulsion.

"To be sure, Section 1183 as amended provides that 'It shall be lawful for the owner to protect himself against any failure of the contractor to perform his contract and make full payment for all work done and materials furnished thereunder by exacting such bond or other security as he may deem satisfactory.' But this is a right which as a citizen, free to contract as he may desire, the owner possesses regardless of the statute and it in no way lessens the effect of the statute coercing the owner and contractor to execute such bond as is provided by statute, and to make it a part of their contract. The court here holding as it does that the statute under consideration is unconstitutional as above indicated, it will not be necessary to discuss other points raised by the demurrer. The demurrer is sustained."

In the second case mentioned, that of Jas. Shultz Lumber Co. vs. Thos. Darling, et al., seeking to recover $1161.11 and basing the claim on the bond without reference to the existing mechanic's lien law, the court's opinion was:

"Unlike the case above mentioned, the case here does not allege nor can it anywhere be inferred from it that the undertaking stated to have been executed by the defendant American Surety Co. was pursuant to the provisions of the mechanic's lien law statute of the State of California. A copy of the bond is not attached to the complaint. On demurrer therefore it will not be treated as statutory but will be presumed to be a common law undertaking."

The Analogy Between Horse Racing and Estimating

By G. ALEXANDER WRIGHT, Architect, in The Journal of the American Institute of Architects*

MAY it not truly be said that there is very little difference between horse racing and bidding on buildings? Are they not "gambles?" The invitation to figure and the jockey's start are similar; both events arouse a like interest; both hope to win. The odds are long, for there are many entries. There is the usual horse racing talk about the "dark horse," the "favorite," the "pull," the "inside track,' 'and so forth, none of which is probably ever true, in either case; but it is horse racing talk.

At last the start is made, and away they go! The bidders and the ponies over the same ground, the same course, and the owners look on and speculate. The primary object is to get ahead of each other, win at any cost, and each competitor does his best to beat the other fellow. If the first jockey in has forgotten or omitted anything, he is disqualified. If the bidder forgets or omits anything, he "gets the contract." It amounts to about the same thing, and the bidder is quite as much of a real sport, for he takes "his medicine today and gambles again tomorrow." But this not what I started out to say. If, perchance, it has had the effect of seriously arresting the reader's attention to a most important subject, some good purpose may yet be served.

And now to be serious: Speaking of estimating in competition, an experienced and well respected western contractor recently described our present estimating methods to me as "a horse racers' gamble." Few architects, if they will look squarely at the facts, can honestly differ with the candid western contractor. Owners, and persons not over kindly disposed toward architects, claim that we know but little about the "cost" of a building; but these same people do not themselves know anything of the mysterious and devious processes involved in the obtaining of a bid, which, unfortunately, they too often think is to be the "cost" of the building. Architects, however, know of these things, and that the word "estimate" or "bid" does not really mean the "cost," when the work is finally completed. Architects, however, seldom deem it their duty to enlighten clients upon such matters, and this is especially so in the case of the architect who, by whatever means he may choose to employ, is able to persuade owners into believing that he can give them cheaper and quicker results than some other architect having offices round the corner.

It is not an unusual circumstance for a contractor to sign up for a job, when even the best of us are morally certain that the work as shown and specified, can never be properly done for the money. But we as architects are paid to see that it is so done, are we not? Why then should we allow an owner, or ourselves, to accept such a bid, and so to place this burden upon any contractor, who, for want of a systematic method, underestimates his quantities, or, as too often happens, omits something entirely? Some owners (happily not all) are looking for these mistakes, and are ready to seize the advantage, usually in the msitaken idea that they are to get something for nothing. Some architects will be perfectly content with the thought (more is the pity!) that it is none of their business; that it is up to the contractor to look out for himself.

It is well known that under our uncertain system of estimating, by which the contractor is made to take all the chances, these things do and must occur; that they are winked at, and that they cause much unnecessary

*Author of Wright on Quantities.

trouble. But is this good practice, or sharp practice? Surely our ethics should extend beyond the mere personal equation; so, to put it plainly, is it "honest?"

Is it just, when we, in a sense, undertake to act as architects and arbiters of the contract? If not, can we wonder at the thousand and one questions, difficulties and extras which occur in the supervision of such a contract, under the present system? Can we wonder that contractors are sometimes suspicious?

But, not to dwell too long on this picture, let us seek a practical remedy for removing these and other similar conditions which make such a picture possible. The individual architect or owner, let it be said, is not solely responsible. The entire trouble lies in our senseless, wasteful, unscientific, and wholly faulty methods of inviting bids, and in the encouragement to gambling which we, who should be the first to condemn, still extend to bidders. That the contractors do not rise up and smite us, is really a source of wonder to me. Not our business, indeed! It is our business to encourage better and more honorable methods.

The scope and character of our construction has advanced so rapidly and considerably of recent years, that scarcely anything is done now as it was even twenty years ago; and the time now allowed to a contractor for estimating is altogether too short; conditions are not conducive to accurate results. Without accurate quantities, there can be no accurate bids, and with our rough-and-ready guess-work methods, wide differences in bids must necessarily prevail. The lowest bid is usually by no means the most accurate, and frequently it is out of all proportion to the quantity and character of the work under contract. Before the work proceeds very far, the mistake is discovered; then there arises the natural desire of the contractor to save on his contract.

But the difficulties, and sometimes friction, which we meet with upon our buildings in progress are not usually caused by the effort of the lowest bidder (sometimes spoken of by the daily press as the "fortunate" contractor) to make a larger profit than that to which he is entitled; the difficulties are quite as often due to his not unnatural wish to keep his loss on the contract within the smallest possible limit.

Therefore, is it not indisputable that incorrect quantities are in the first place largely responsible for unnecessary low, and consequently inaccurate bids, which, in their turn, cause so many of the architect's troubles?

Another factor is the too short time allowed to bidders for estimating, while a third and very important factor is found in the fact that our modern methods of construction require special training in order to take off quantities accurately. Few contractors possess these advantages, and even if they did, fewer still could find time to put the principles of scientific quantity-taking into profitable effect.

The ridiculous—even the ludicrous—side to our present way lies in the fact that when contractors are invited to submit a bid in dollars and cents in competition, off they go (like the race horses) to compete against each other, neck and neck, as to the quantity of material the job will take; and the more careful a bidder is in taking off his materials accurately, the less chance he has, under present methods, of getting the job!

The whole business seems absurd to any one with any pretense to experience in quantity taking. There can only be a certain amount or quantity of material necessary, and no amount of figuring can make it less; it is folly, therefore, to think that a number of bidders on a piece of work will all succeed in taking off just the right quantity; one person might, but not a dozen or more.

If some system could be adopted whereby each bidder would be furnished with a complete, detailed list of the exact quantities of materials and labor required (thus placing all bidders on the same basis), then the competent, careful contractor would get more contracts at proper prices, and so be able to do better work, while the incompetent and the shoe-string bidders would either have to become more competent or seek other fields of industry, a result which would prove quite as much of an advantage to architects as it would to the remaining contractors.

It is obvious that some such system must in time displace our present wasteful and primitive method, if for no other reason than for the benefit such a system would confer upon both architect and client. It would seem that much good would result if the chapters throughout the country gave some consideration to this vital subject and familiarized their members with the advantages that would follow the adoption of some standardized method or system of estimating upon quantities. This and other kindred subjects have recently been receiving consideration in certain chapters, while many architects and contractors in different States are well known to favor the adoption of an estimating system, based upon accurate bills of quantities, which shall become the true basis of the contract. This will certainly be done some day, and then we shall all wonder why so much time, effort and money has been thrown away in the past.

* * *

Cass Gilbert Adds to His Honors

DETROIT'S new $1,000,000 library will be constructed from a design submitted to the public library commission by Cass Gilbert, of New York City, whose plan recently was adjudged by a jury of experts to be the best of six plans submitted by architects of New York and Detroit.

Fireproof construction will prevail throughout, and the exterior will be executed in cut stone work. Interior arrangements are designed along the simplest possible lines, and there will be ample aisles, and a great array of modern conveniences. Book lifts and flights of steps will be supplied.

Simple, classical lines will predominate in the new structure, which is to comprise two stories and a mezzanine floor. The approximate bulk of the building will be 1,700,000 cubic feet. Capacity for 500,000 volumes will be contained in the stock room, which is to be well lighted by natural light.

The children's department, with its two large rooms, one of which is for story telling, will be upon the ground floor. The same floor will house the following features: Staff quarters, with rest room, lunch room, kitchen, lockers, department of branch libraries; department of stations; binding department; printing department; janitors' quarters; storerooms and delivery platform.

The main floor and its mezzanine auxiliary will include these: Circulation department, open shelf room, periodical and newspaper reading room, reference group, industrial arts group, fine arts group, special library, two club rooms, for use of groups engaged in study, or as committee rooms, executive department, order and catalogue department, staff assembly room and apprentices' class room.

Mr. Gilbert will receive six per cent of the $1,000,000 appropriation for the library.

The Architect's Fee

IN view of the many published statements about the large fee to be received by Guy Lowell, the architect of the new court house for New York, it is interesting to observe the element of uncertainty which attaches to the profit to be derived from an undertaking of this magnitude.

The cost to an architect of preparing his drawings and specifications and seeing that they are properly carried out, in offices run on the best business basis, is at least one-half of his commission, says the Philadelphia Ledger. This, however, applies only to the general class of buildings and not to residential or public and monumental work. The cost is then as high as seventy-five per cent of the architect's commission.

The United States government prepared a statement which was submitted in Congress (Senate document No. 916, Sixty-second Congress, second session) which gave the average cost of preparing drawings and specifications alone, exclusive of superintendence or any other field expenses, for the years 1905 to 1911, inclusive, to be 6.2 per cent. This was for preparing the drawings for the buildings erected by the United States government and done by the Supervising Architect of the Treasury, a man known for his great executive ability, and, therefore, done with the greatest economy possible.

Reports have been submitted by the State architect of New York showing that the cost to the State for preparing the plans and specifications made in the State architect's offices exceeds six per cent. The cost to the New York Central railroad for preparing the plans for their new station has exceeded six per cent. Therefore, an architect who is able to prepare the plans for a $10,000,000 building at a cost to him of less than six per cent of the total cost of the building, must run his office in the most economic manner possible and take his chance that the work may cost him more than his entire fee.

It seems to be the general impression in many uninformed places that an architect makes a few sketches taking a few days of his time and for this work receives an enormous fee. The fact of the matter is that to prepare the plans and carry out the work of a $10,000,000 court house, will require the services of from twenty to thirty high-priced draughtsmen, as well as a number of engineers and specialists on structural work, heating and ventilation, sanitation, mechanical equipment, etc., working for a period of at least five years; will require a large office at a high rental, and with the most economic administration, his work will cost about $450,000. This will leave him about $150,000 profit, or about $30,000 a year.

What business man is there who is willing to head a $10,000,000 corporation with a salary of $30,000 a year? What corporation is there of this size that pays its counsel less than this amount? Such men, however, receive these salaries without investing any of their own money to obtain it. The architect must invest about $450,000 in actual cash paid out to receive his profit of $150,000.

All of the above has nothing to do with the professional training and skill of the architect and for which he receives his compensation. He must, therefore, not only invest his own money and run a large business office with a chance of running it at a loss, but he must give his skill to the designing, his knowledge of engineering and construction, and his training in sculpture and mural decoration in order that he may obtain his fee.

Of course, it would be possible for an architect to have his work cost him less than one-half of his commission, and the result would be poorly prepared plans and specifications and inadequate superintendence of the erection of the building, which would result in a greater cost of the building, a far greater cost than any saving in the commission paid to the architect. In carrying out the work of the new court house, the architect will have to give almost his entire time and attention to his one piece of work and in comparison to the fees or salaries paid to the best men in other professions, his compensation will be very small.

* * *

The American Institute Convention

ANNOUNCEMENT is made that the next convention of the American Institute of Architects will be held in New Orleans on December 2 to 4. This will be the forty-seventh annual convention. The American Institute is the one central organization of architects in this country. It consists of thirty-two chapters and two State associations, as follows: Atlanta, Baltimore, Boston, Brooklyn, Buffalo, Central New York, Cincinnati, Cleveland, Colorado, Columbus, Connecticut, Dayton, Illinois, Indiana, Iowa, Kansas City, Louisiana, Louisville, Michigan, Minnesota, New Jersey, New York, New York State Association, Oregon, Pennsylvania State Association, Philadelphia, Pittsburgh, Rhode Island, San Francisco, Southern California, Southern Pennsylvania, St. Louis, Texas, Washington, Washington State, Wisconsin, Worcester.

Glen Brown, secretary of the institute, has notified the various chapters that the principal topic for consideration at the coming convention will be the discussion of some law by which the government may secure men of the greatest ability in the architectural work of the United States. The repeal of the Tarsney act by the last session of Congress makes action on this subject an important public service.

The present officers of the institute are:

President—Walter Cook, New York, N. Y.; First Vice-President—R. Clipton Sturgis, Boston, Mass.; Second Vice-President—Frank C. Baldwin, Washington, D. C.

Board of Directors, one year—A. F. Rosenheim, Los Angeles, Cal.; Thomas R. Kimball, Omaha, Neb.; Milton B. Medary, Jr., Philadelphia, Pa. Two years—Irving K. Pond, Chicago, Ill.; John M. Donaldson, Detroit, Mich.; Edward A. Crane, Philadelphia, Pa. Three years—Burt L. Fenner, C. Grant LaFarge and H. Van Buren Magonigle, all of New York City.

At the coming convention nominations for officers will be made, as it will be necessary to elect a successor to Walter Cook, the retiring president, and other officers, including three new members of the board of directors.

Reports will be received from all standing and special committees of the institute, which yearly accomplish a vast amount of work in the interest of the profession. The most important of the committees are Allied Arts, Government Architecture, Education, Competitions, Conservation of Natural Resources, Electrical Code and Fire Protection, Town Planning, Legislation, Public Information and Contracts and Specifications.

* * *

"Bill's going to sue the Company for damages."

"Why what did they do to him?"

"They blew the quittin' whistle when 'e was carryin' a 'eavy piece of structural iron, and 'e dropt it on his foot."

Water in Concrete Mixtures

THE occasional failure of important concrete structures, when subjected to floods or other unexpected conditions, indicates that low cost and profits are given more consideration than strength and durability. Then, again, from the writer's observations of the work of others, he is led to believe that while a careful study has been made of cement, sand, and aggregate, the function, purpose, and effect of water in the mix is little understood.

Cement, sand, and the coarser aggregates are inert solids without cohesive or adhesive power. Water, on the other hand, is a fluid without adhesive or sticking power to join two substances together. But water has a very strong surface tension. This is exhibited in what is known as capillary attraction. It is water that binds the inert materials together. This binding power is greatest when every particle of cement, sand, and aggregate is covered with a continuous film of water. If too little water is present, or if it is not evenly distributed, the water film will be broken. If, on the other hand, the thickness of the film is increased to the filling of the interstices between the aggregate this binding power decreases until it is nothing when the solid particles of the mix become immersed in the water.

In addition to being a binder of the solid elements of the mix, the water acts as a lubricant, allowing the solid particles to slip on one another and assume positions resulting in smaller interstices. This increases the density of the mass, and also the capillary attraction of the water film, provided there is not sufficient water present to destroy this film tension. When the excess of water destroys film tension the solids become separated or "suspended" in the fluid. The finer particles of cement "float" in the water filling the interstices or settle from the mass on agitation, and at the same time the "lubrication" of the larger particles is not increased.

It is the finer particles of the cement that develop the greater strength, but when suspended in the fluid or separated from the mass, the "hands" of these particles are not sufficiently long to bridge the water gap separating them from one another or from the larger solids.

It is far easier to build up the water film by careful addition of water than it is to distribute the water after it has been added. If excess of water is added to one part of the mix, so as to "float" the fine particles of cement, it is a question if the film tension can be restored by mixing this with drier materials. This kind of concrete may appear all right, but one part of the mass will not be sufficiently lubricated so the solids can assume the positions for greatest density, and the other parts will be over wet so that the particles of solids will be separated by excess water, and film tension will be lacking in either case. When water is poured or flows from a pipe or nozzle, this is sure to be the effect. The less nearly the cement fills the interstices of the aggregate the more pronounced the effect will be from improper watering. When the water is in just the right proportion to furnish the lubricating effect and the greatest binding power, these forces tend of themselves to draw the particles together into the dense mass.

The third property of water in concrete is to furnish the element that causes crystallization of the cement, giving to the concrete its strength. The observation of the writer leads to the belief that the crystal takes the best form when the water is present as just described. But this will not give sufficient water for the complete growth of the crystal. More water must be fed it during the time of curing in order to grow it to maturity.

The writer has used much bank gravel in concrete construction. He has found it economy to screen the fine from the coarse aggregate. Mix the fine aggregate and the cement, and then mix this with the coarse aggregate, thor-

oughly drenched. Following thorough mixing, water as needed, is added by sprinkling until tempered to the proper consistency. The sand, fine aggregate, should be just sufficiently damp to cause the cement to adhere. This dampens the cement and establishes capillary attraction. The coarse aggregate has but little capillary attraction and, on mixing, its excess of water is taken up by the superior attraction of the finer materials. In this way the material is all bound together.

With proper watering and curing the same strength is developed with one-half the cement as with improper watering. And when the work is properly managed the cost is very slightly increased. This is true of either hand or power mixing. It is simply a question of whether it is best to add brains or additional cement to the mix.—Municipal Engineering.

* * *

Twelve Barrels of Whitewash

IN this age of great undertakings it is well not to lose sight of the little things that so often make them possible, says "Youth's Companion."

A newspaper man who was writing a series of articles about the men who are at the head of large and successful businesses called upon the general manager of a factory where concrete blocks are made. This man had brought the business from a precarious and feeble infancy to a condition of great financial strength. The interviewer wanted to hear about the first practical thing the man had done to improve the working conditions, and increase the efficiency of the plant.

"The first thing I did was to buy lime enough to make twelve barrels of whitewash," said the manager; and he smiled at the recollection.

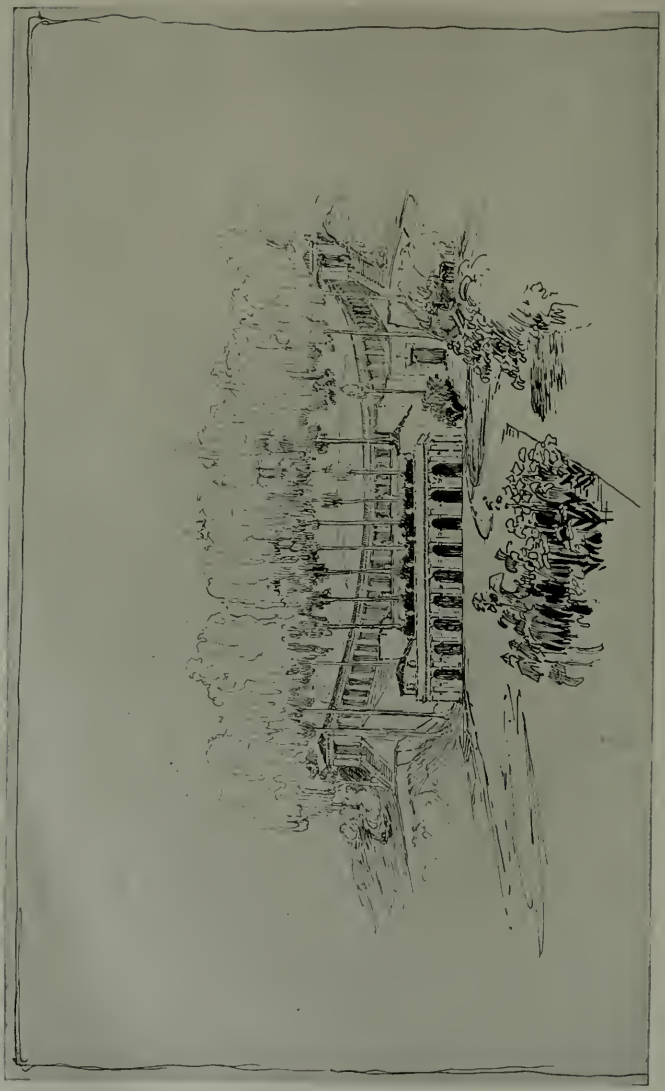
"Good," exclaimed the reporter, quick to recognize the kind of story he wanted.

"The first thing I learned after coming here was that the company had difficulty in keeping good laborers. The hours and wages were right, and nobody could understand why so many left, or why the ones who remained were surly and discontented. I went out to take a look round the factory, and I found the trouble in about five minutes. The place was too dark and dirty!

"Making concrete blocks is not a clean job, at best, and it is impossible to keep a factory free from the flying dust, but there was no reason why the place should be so dark. We could not put in any more windows, so I decided to light the great, dingy, barn-like structure from the inside. In the center of the room was a pit about five feet deep, in which the base of the engine rested. That pit made me shudder; it reminded me of one of Poe's tales. It was so dark that every time a man went down to oil the machinery he had to carry a torch, and grope his way down a ladder.

"That very day I ordered the whitewash; it was the cheapest artificial light I could provide. I gave every available man a long-handled brush and a ladder. They went to work with enthusiasm, and in a short time we could hardly believe we were in the same building. The men even whitewashed the pit, and after that it was never necessary to carry a torch. The surly discontented laborers turned into well-behaved, decent workmen, and we had no more labor problems to solve.

"Those foreigners had never studied phychology, and they had no idea that after that they did more work in a day, did it better, and with less physicial exertion than before. After all, psychology is too big a name for it; it is common sense. Whitewash is cheaper than strikes. Since then I have continued to apply it—figuratively—to a great many dirty situations in business life, and it never fails!"



Open Air Theater, Occidental College, Los Angeles

Myron Hunt, Architect

The California Bungalow an American Creation Developed to Fill Present Day Needs

By M. D. HITE, Architect, New Orleans

"THE article by Prof. Curtis, of Tulane, which was printed recently, stating that the 'New England colonial' style of architecture is 'more appropriate to our Southern conditions than the California bungalow,' is an assertion made without full qualification. As an architect who has extensive experience in the designing of homes, I agree with Mr. Curtis when he says that the New England colonial is a graceful and charming style. But I differ with him when he broadly encourages a style such as the New England colonial, which is based, not on the life of our modern times, as the bungalow is, but on conditions of life 150 years ago. It was then a logical evolution of the conditions of its own crude time. Architecture in its best phases is a product of its own time, fitted for the purpose and needs of its own day. All the best architecture of the past that is copied by the architects of today was the style best fitted for its own particular period of history. The continued imitation by the architects of the present, copying the dead forms of antiquity without regard to their fitness to the different methods of construction of the Twentieth century, is one of the marked characteristics of the profession and helps to keep it in the dark ages. So, when Mr. Curtis claims the New England colonial as being the best-suited to our modern conditions, he but helps to sustain the antiquated point of view of the profession at large and but adds to the influences that serve to keep modern architecture at a standstill while every other profession in the world is making giant bounds forward. Every profession welcomes men who see ahead, who think progressively forward, but the profession of architecture welcomes only the man who keeps his face to the past. Who dares to look forward is classed as a reactionary. Mr. Curtis is an architectural professor at Tulane University, and, like all modern professors in architecture, is under the influence of the Ecole des Beaux Arts de Paris, the school which sets the fashions in architecture as the French dressmakers and milliners set the fashions for women's clothes. But the progressive woman today is listening acutely to a call for the creation of American fashions in America, and Paris is ceasing to be the style god. But architects, with a fixed policy, continue to hearken to the styles that Paris decrees in buildings.

The New England colonial style that Mr. Curtis praises while disparaging the modernly and scientifically planned bungalow, is a style of which the many existing examples are exceedingly graceful and elegant. But they are fitted only for the conditions of a crude period of history. By an accident of the educational fashion of the time the style partook of classical details from antiquity for its doorways and other features. In those days the mechanical equipment of a residence, which is so vital a thing today, was unknown. The houses then were planned as a barracks is planned today, but not as good, for even a modern barracks is equipped

with bathrooms, ventilation, heating, electricity, hot water and a vacuum cleaner. None of these, of course, were in existence in 'colonial' days, although plumbing has existed since earliest historical times. So that to transplant a New England colonial or a Georgian or Dutch colonial, or the colonial of the French and Spanish domination, or of the Greek revival, would be to offer the people of today a barracks-like home, and, when the modern mechanical equipment of the house is so changed to accommodate the modern features that the best that can result is a half-way efficient compromise, basically unscientific, and results in a 'hash.'

On the other hand, a bungalow is planned first for the convenience of its intended occupants, housework is reduced to its simplest terms and all matters of modern life are considered, and then it is designed and constructed in a natural manner. That is all there is to the bungalow when it is rightly done. Unless it will stand this analysis it is not a bungalow. The bungalow is simply a scientifically designed habitation for man. There is nothing useless or unmeaning in it or on it.

Architecture is a broad subject, and every statement must be qualified. Successful architects are unusually gifted men, for the profession is an arduous one, combining the artist, engineer and executive business man in one individual. Progress of architecture is mostly a history of modern engineering. The fine buildings, the great hotels, the skyscraper, the efficient home of today is not due to the architectural profession. Left to itself, it would still be building Greek and Roman temples—lovely, but useless today. The architect but follows the engineer's initiative. The architect of today has lost his ancient signifiance, when he really was the master workman and artist. Today he merely compiles ideas and assembles a vast array of manufactured materials; his work consists in the arrangement of the plan and designing the 'skin' of the building. The engineer is responsible for whatever efficiency and comfort the building possesses. The architect clothes the huge machine we call a building that is vibrating with the wonders of mechanical ingenuity, that is pulsing with the life of the times, clothes it in a form bearing a thousand earmarks of the buildings of ancient days, a detail from one, a gewgaw from another and meaningless forms that are a mockery of the science and efficiency displayed throughout the structure by the allied arts and trades. If the ancient Greeks and Romans and Renaissance architects, and they who builded the thrilling Gothic cathedrals, or our Pilgrim forefathers, who built the 'New England colonial' houses, had done half so bad a thing in their own time they would be pitied today as puerile and rank imitators, slaves to a finished past, fearful of attacking their own problems in their own way. But it happens that it is not at those old-time architects that we laugh today, for they builded well and for their own life, but it is the architects of our own time we stare at with wonderment akin to pity. We must judge by results only. The part of the architect in the progress of the building art of this century can hardly be discerned.

In southern California, where the bungalow flourishes most, the average of beauty and clarity of design in the moderate-size house is much higher than in any part of the country. New Orleans, where the 'double cottage' and its kind flourishes by thousands, with the deathly lack of sunlight, air and ventilation in such houses, is a city of sheer ugliness, by comparison. The rows and rows of such houses can be compared only to a tenement district of one of the greater cities. Poor architectural principles react on a community. The bungalow aims to provide efficient habitations for human beings. This is a clean age and human beings require conveniences.

The bungalow is architectural logic as exemplified in house-building. Therefore to encourage the people of today in this alive, vital, pulsing age to follow an obsolete style unsuited to the time, such as the New England colonial, is not conducive to betterment of living conditions or of architectural progress.

The bungalow is not the final solution, but we who build them feel that our work is forward, and it is pregnant with hope.

* * *

Moving Steel Buildings No Longer an Experiment

MOVING steel frame buildings is becoming quite popular since the San Francisco Board of Works started to move with success the Commercial High School from Grove street to the other side of Van Ness avenue. Here is what they have done along this line in New York City:

A steel frame house, measuring 41 feet by 27 feet, and consisting of two stories, which, with its tower, 62 feet high, weighed about 150 tons, was recently moved from 132d street and Lexington avenue, New York City, to a site more than three blocks away without interfering with the active service of its occupants, who are the crew of the municipal fireboat C. W. Lawrence.

The building was moved to clear the site and facilitate the operations of the contractors for the construction of the steel tubes under the Harlem river for the new Lexington avenue subway. The house was jacked up about 3 1-2 feet in the week previous to its removal and lowered to a bearing on iron pipe rollers on four lines of timber runways extending across the deck of a 30-foot by 80-foot barge moored to an adjacent dock. Tackle attached to the house was operated by the hoisting engine of a piledriver, and in about five minutes the house was pulled 23 feet to the edge of the barge. The pulling was then continued intermittently so as to advance it about 3-feet across the barge at intervals corresponding with 3-inch rises in the tide, thus unloading the barge so that its increased displacement corresponded approximately with the lifting effect of the tide and the deck was kept at about the original elevation despite the added load. In this way the entire weight of the house was transferred from the shore to the barge in about 45 minutes. The barge was towed to its new location in 12 minutes. It was unloaded from the barge on a falling tide by reversing the loading operation, and was moved across its new pier, revolved 35 degrees in a horizontal plane, and transferred to its new foundation, where plumbing, electric light, telephone and fire alarm lines had been prepared for immediate connection.

During the time the house was being moved, flexible connections were maintained with the telephone and fire alarm cables so that the firemen remaining in the house during its transit were not deprived of the regular alarm service except during the 12 minutes that the barge was in motion, while even during this period a temporary telephone booth was installed in order to maintain communication. An alarm was given and the fireboat called out while the building was being placed on the barge.

* * *

Advertising

Robert Edeson believes in all the modern improvements, including advertising, and proves it by the following: "When a duck lays an egg she just waddles off as if nothing had happened. When a hen lays an egg there's a whale of a noise. The hen advertises. Hence the demand for hens' eggs instead of ducks' eggs." —Young's Magazine, September.

How to Lay a Concrete Floor

By H. M. BAINER, Colorado Agricultural College

TOO much care cannot be exercised in preparing the foundation for a concrete floor. This should always be well drained, and firmed to a depth of from six to eight inches below the concrete.

It pays to tamp this foundation thoroughly before putting on the mixture. If the soil contains a great deal of clay, it may be necessary to remove part of it and to fill in with broken stone, gravel, or cinders to within four or six inches of the proposed finished surface, depending upon the thickness of the floor. Blind drains of coarse gravel or tile may be laid from the lowest points in the excavation to carry off any water that may accumulate beneath the structure.

For the construction of the ordinary stable or barn floor, which is not to carry any great weight, the following proportion is to be recommended for the concrete base: One part cement, 2½ parts clean, sharp sand, and 5 parts loose gravel or broken stone. This should be finished on the surface with a 1 to 1½-inch layer of a mixture of 1 part cement and 1½ to 2 parts of clean, sharp sand. The total thickness of this floor must be from 5 to 8 inches, depending upon the load it is to carry.

For engine foundations, floors, or driveways over which heavy loads pass, the following proportion is to be recommended: One part cement, 2 parts sand, and 4 parts broken stone or gravel.

For all large floors, it is advisable to place the concrete in sections not to exceed 6 feet square. This may be done by placing a 2-inch plank of a width equal to the desired thickness of the floor on edge, as a box in which the concrete is tamped until water begins to show on top. Make several of these forms, holding the plank in place by means of stakes driven into the surface. These stakes should be driven on the outside of the form so that they can be easily removed after the concrete has partly set and the planks have been taken out. Fill alternate forms at first, tamping the concrete thoroughly, especially the edges. As soon as the concrete has partly set, remove the plank, and fill in the forms not filled at first. Mark the side plank to show exactly where the joints come.

The finishing coat should be spread on before the concrete has set. To make this of uniform thickness, it is best to place either 1-inch or ½-inch wood strips, as is desired, on top of the concrete, over which a straight edge may be run. Smooth with a trowel for a smooth surface, or with a wooden float for a rough surface. Groove exactly over the joints of the concrete so as to level the edges of each block. Do not trowel the surface too much, as it tends to separate the cement from the sand and injure the wearing surface.

The floor should be constructed with slope enough to carry all liquids to certain points from which they may be drained. Protect the new floor from the direct rays of the sun, currents of air, and frost; and keep constantly moistened for several days. Water is very important in the curing of concrete construction, and must be liberally used.

Use nothing but the best cement that can be obtained. The sand should be clean, sharp, and not too fine; it should be freed from loam or clay, as these will tend to destroy the adhesive quality and retard the setting of the concrete. Use only pure water for mixing. Mix thoroughly. Water thoroughly. Cure thoroughly.

Building at Post and Fillmore Streets, San Francisco. Faced with Sacramento Sandstone Brick
Reid Bros., Architects

Why Skyscrapers Must Be

LOTS of ordinary size in the congested districts of New York and Chicago are now sold as high as $18,000 a front foot. With land at this price the skyscraper is a commercial necessity. The erection of a skyscraper increases the value of the land it occupies as well as that of adjacent land, and it is impossible to guess where the limit of height will finally be placed. A thing often discussed is the limit of height on account of the increasing space required for elevator service. This limit, whatever it may be, is not even approached in buildings of large ground area now being erected. A leading elevator company estimates roughly that one square foot of elevator area is required for each 500 feet of office space. Twenty high-speed elevators are sufficient for a building twenty-two stories high and covering half a city block, while twice this number might be installed without serious loss of floor space. The limit is not now imposed by the elevator service. But there is a limit due to the darkening of the streets by excessively high buildings. Even this may be overcome by building these structures as stepped pyramids, as is now proposed, each tenth story being set back from the line of the stories below, the whole rising one hundred stories or more into the air and terminating in a central tower. The skyscraper of 1913, large and imposing as it appears at the present time, may seem insignificant twenty years from now.—"Building Management."

* * *

Big Improvements at Monterey Presidio

Improvements aggregating $300,000 are planned for the Presidio of Monterey. Plans for the work have been prepared and include eleven reinforced concrete stables, several new barracks, etc. It is said the work will be done by day labor.

Some Notes on Causes of Failure of Stucco Work

A NUMBER of years ago stucco was quite generally used in certain localities, but owing to failures of the material to withstand the action of the elements and to other causes, this type of construction was almost entirely abandoned. During the last few years, however, there has been a very marked tendency by the building public to take up this class of construction again, therefore this word of caution.

We do not want to have the same experience with this type of construction as the concrete block industry has had, and yet, unless due care is used in drawing specifications and in their application, there are going to be a great many failures as in the past. Our architectural friends are very partial to stucco exterior, and if it is properly mixed and applied will come up to their expectations in every way. So much depends on the selection of the material, proper mixing and proper application that only skilled mechanics who are familiar with this class of work should be employed.

I remember one residence in particular, where there were a great many horizontal cracks in the stucco running almost the entire length of one side of the building. These cracks were about two feet apart and were very pronounced. The whole area of sides and ends was very unsightly. After a very careful investigation it was found that in nearly every instance where cracks had developed that they were at a point where the wire lath was lapped and in many places less than one-quarter inch thickness of stucco was over these laps. In some instances by cutting out the cracks it was found that the metal lath was not even tacked solidly in place, and yet stucco work in general was condemned by a number of parties on the results obtained on this one building. It was quite apparent that the trouble was not due to any fault of the material, but in this particular instance was due entirely to the application of the wire lath and stucco. In addition to the large cracks at the laps of the wire lath, there were a number of hair cracks throughout the entire area, which apparently were caused by too much troweling of the concrete mass, and as was found by investigation there was a coating or frosting of Portland cement on some of the areas and the cracks penetrated just through this frosting. Other areas were entirely smooth and cracks had not developed.

In another case regular lime mortar plaster without any Portland cement was used for the scratch coat. The second and finishing coat consisted of a poor mixture of Portland cement and sand. The finish coat was only about one-quarter-inch thick. Moisture penetrated through the finish coat and the mortar composing the scratch coat being subjected to continued moisture disintegrated and the stucco came off in sheets.

The third case was very similar to the second, although wood lath was used instead of wire lath on a small building near the sea shore. The scratch coat material consisted of regular interior plaster and the second coat consisted of Portland cement, asbestos rock and asbestos fiber. The second coat was very thin and the damp salt air and moisture penetrated through to the first coat. The lath became swelled and the stucco came off in sheets. The stucco on this work was condemned and the faults were laid at the door of the asbestos and Portland cement. Upon investigating the matter thoroughly, it was readily proven that the entire trouble was due to the nature of the lath and the materials entering into the first coat.

I have referred to these buildings with a view of cautioning people interested in stucco construction to see that this particular part of the

building is given proper attention. In the past stucco has been applied in two coats, the total thickness being about one-half inch to five-eighths inch. Past experience is teaching us, however, that one inch is by far better and if the material is applied in this thickness, house owners and architects should not have reason to regret its use.

Another point of considerable importance is the color. A uniform color is rather difficult to obtain on smooth surfaces particularly, but it can be obtained if proper attention is given to the selection and mixing of the ingredients and if the stucco is properly applied. When Portland cement and sand are used it is very essential that the sand should be absolutely free from any organic materials which have a tendency to discolor. It is also of vast importance that the ingredients be mixed very accurately and carefully and that a sufficient amount be mixed at one time to cover certain areas exposed to the same lights and shadows.

For example, the work should not be left in an uncompleted condition half way between windows or half way down the side walls, for just as certain as this is done, there will be a streak showing where the later work was started. If it is necessary to do a certain given area at two operations, care should be used to get the materials properly blended and the new stucco floated or trowelled to correspond exactly to that already done. By using a little care on details of this kind the ultimate results will be much more satisfactory.

Portland cement and sand as a stucco mixture has been used with fair success where work has been carefully supervised, but there has been such a lack of proper attention to the mixing and application that there have been some very bad failures. The use of asbestos rock and fiber to take the place of sand is meeting with considerable success. The asbestos fibers have a tendency to hold the water which is used to mix the concrete mass, longer, thus giving the Portland cement ample opportunity to become properly set and in this way stucco mixtures are possible that are more uniform in color and less liable to crack as the fiber also furnishes additional bond.

There is one point which is frequently lost sight of, that is, it is possible to manufacture or make concrete slabs that are free from cracks and that can be exposed to the elements for an indefinite period without discoloration. Therefore, should cracks develop in a well constructed stucco work it can be invariably traced to settling of the building or the shrinking of the frame. By insisting upon thicker stucco walls the liability of the stucco cracking is reduced to a minimum.

The price of lumber is readily advancing and the desire for fireproof exteriors, especially in the suburban districts, as well as artistic effects that may be obtained from stucco, are creating a universal demand for this type of construction and while the initial cost may be slightly more it is such a small part of the total outlay and such an important part of the structure that the best is the cheapest in the end.—Cement and Engineering News.

* * *

The Cost Problem of Architectural Exhibitions

ONE of the vital topics of discussion at the recent convention of the Architectural League of the Pacific Coast in Portland, Ore., was the cost and management of the architectural exhibitions. It was the original plan of the League to hold a circuit of these exhibitions each year in the principal cities of the coast, concentrating of course on that par-

ticular city where the annual convention happens to be held that year, the local exhibitions being aided by the loan of drawings and photographs of work secured from the other coast cities and the East. How the exhibition scheme has resulted the architects of the coast already know. Instead of being circuit exhibitions they have been mainly local in character and the local clubs and local advertisers have been called upon to carry the great financial burdens, not only to cover the cost of the exhibits, but of the publication of the year book. In the past, due to the fact that local hangings have predominated and truly representative coast work has been sadly lacking, the necessity of a seperate year book for each of the communities has seemed imperative in the attempt to raise sufficient funds to cover the other expenses of the exhibition.

It is doubtful whether there will be an exhibition the coming season for Southern California unless some radical change in the method of conducting and raising funds for them is devised. At present there is no Architectural Club, this organization having succumbed to the lack of support of its members in the matter of paying dues. Yet the annual exhibitions have been vastly beneficial to the profession, proving of value in an educational way both to the architects themselves and also to the public, in each of which features the profession has gained.

The League, and the several organizations of which it is composed, have apparently come to the point where a revival of the original plan of the circuit exhibitions seems imperative. Such was the spirit of one of the papers read before the League at this year's annual convention at Portland, the speaker urging such a circuit exhibition covering Los Angeles, San Francisco, Portland and Seattle. He estimated the entire cost at about $15,000, or an average of $3,900 for each individual exhibition. He placed the cost of the separate year books at a total of $5,200, and a like total for manager's and assistants' salaries. He suggested one year book to be used on the entire circuit could be published at a cost of $1,500 and much expense be saved by employing one manager for the entire circuit.

* * *

Fifth Avenue's Architecture

Chaos is the only word that one can justly apply to the quaint and inconsequent conceits in which we have indulged since that monumental moment in the early Nineteenth century when, architecturally, all that had been since the beginning ceased, and that which had never been before on land or sea began. A walk up Fifth avenue from Madison square to the park, with one's eyes open, is an experience of some surprises, and equal illumination, and it leaves an indelible impression of that primal chaos that is certainly without form, if it is not wholly void. Here one may see in a scant two miles (scant, but how replete with experiences!), treasure-trove of all peoples and all generations; Roman temples and Parisian shops; Gothic of sorts (and out of sorts), from the "Carpenter-Gothic" of 1845, through Victorian of that ilk, to the most modern and competent recasting of ancient forms and restored ideals. Venetian palaces and Louis Seize palaces and Roman palaces and more palaces from wherever palaces were ever built; delicate little Georgian ghosts, shrinking in their unpremeditated contact with Babylonian skyscrapers that poise their towering masses of plausible masonry on an unconvincing substructure of plate glass. And it is all contemporary—the oldest of it dates back not two generations, while it is all wildly and improbably different.—Yale Review.

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Next Convention City—Seattle.

Alterations to Oakland Building

Architect C. W. Dickey, Central Bank Building, Oakland, is preparing plans for extensive alterations to the old Athletic Building at Thirteenth and Clay streets, Oakland, owned by Abrahamson Bros. There is a large gymnasium in the building, and this is to be converted into two floors with rooms for hotel purposes. About $40,000 will be spent on the work.

WORK IN ARCHITECTS' OFFICES

SAN FRANCISCO AND BAY CITIES

ARCHITECTS HAVENS & TOEPKE, Maskey Building, have completed plans for a three-story class A store and hotel building to be erected at South San Francisco for W. J. Martin. The building will cost close to $70,000.

ARCHITECT MILTON LICHTENSTEIN, 111 Ellis street, has completed plans for a two-story and basement frame and plaster store and apartment house, to be erected at Fourteenth and Market streets for Louise D. Barroillett. The estimated cost is $35,000. The same architect is preparing plans for a two-story frame residence to be erected on Eighteenth avenue for William H. Lowenthal. Mr. Lichtenstein has also made plans for alterations to the store and cafe of the Pabst Brewing Company at Powell and Ellis streets.

ARCHITECT C. W. DICKEY, Central Bank Building, Oakland, is preparing plans for a seven-story class A hotel to be erected in the business section of Oakland. Mr. Dickey is also making plans for alterations to the athletic building at Thirteenth and Clay streets, Oakland, owned by Abrahamson Bros., at an estimated cost of $40,000.

ARCHITECTS ROUSSEAU & ROUSSEAU, Monadnock Building, have let the contract for the construction of a class A theater on Broadway, San Francisco, and the same firm have completed working drawings for a three-story and basement frame and plaster apartment house to be erected on Howard street, west of Sixth, San Francisco, for Mrs. C. Goldblatt at an estimated cost of $20,000.

ARCHITECT WILLIS POLK & COMPANY, Merchants' Exchange Building, have been taking bids for the general construction of the Hobart Building, a one million dollar structure which will be erected at Montgomery and Post streets. This will probably be the tallest building yet erected in San Francisco, measuring from ground to roof 315 feet.

ARCHITECT J. C. HLADIK, Monadnock Building, has completed plans and taken bids for a six-story reinforced concrete hotel to be erected at Fulton and Franklin streets, for J. B. Reiter. The same architect is preparing plans for two other concrete apartment houses.

ARCHITECT HENRY C. SMITH, Humboldt Bank Building, is completing the working drawings for a two-story and basement reinforced concrete school building to be erected at Fairfield for the Armijo Union High School District and will cost approximately $65,000.

ARCHITECT RALPH WARNER HART, Humboldt Bank Building, has recently let contracts for two country residences, one for Maxwell H. Thompson at Ross Valley and the other for Miss Marguerite Foster at San Rafael.

A NUMBER of San Francisco and Oakland architects will submit plans on October 7th for a class A jail building for Kern county. The competition is being conducted by the county supervisors, of which I. L. Miller is secretary. The building is to cost $150,000.

ARCHITECT CHARLES PETER WEEKS, Mutual Savings Bank Building, is preparing plans for a two-story and basement frame and plaster country residence and garage to be erected at San Mateo for William C. Duncan. The estimated cost is $20,000. Mr. Weeks has also made plans for extensive improvements at the Union Iron Works.

ARCHITECT CHARLES PAFF & COMPANY, Merchants' Exchange Building, have completed plans for a three-story class A store and lodge building to be erected on Valencia street for the Carpenters' Hall Association. The same architects have also made plans for a three-story building for the Sailors' Union.

ARCHITECT L. D. ESTY, Santa Cruz, has prepared preliminary plans for a group of Mission style school buildings for the Union School District at Soquel. A bond election will be held to raise the necessary funds.

ARCHITECTS WELSH & CAREY, Merchants' National Bank Building, have prepared plans for a four-story frame flat building to be erected on Fulton street for A. Paladini. The same architects are at work on plans for a five-story reinforced concrete apartment house to be erected near the Panama-Pacific Exposition grounds and to cost in the neighborhood of $60,000.

ARCHITECT EDWARD T. FOULKES, Crocker Building, San Francisco, has completed plans for a concrete, stone and marble mausoleum to be built in Riverview Cemetery, Portland, for Edward Holman. The cost will be about $25,000.

ARCHITECT JOHN HUDSON THOMAS, Berkeley, has let contracts for the construction of a two-story frame and plaster residence in North Crsgmont for O. J. Runoele. The same architect is completing plans for a plaster house to be built at Belvedere for W. B. Short.

ARCHITECT ARTHUR G. SCHOLZ, Phelan Building, has taken figures for the erection of a reinforced concrete and brick bottling works for the C. F. Wagner Company at Eighth and Harrison streets. The buildings are designed in the old German style. The same architect has also completed plans for a $15,000 frame and plaster apartment house.

ARCHITECT PHILIP SCHWERDT, Phelan Building, has made plans for a three-story frame and plaster apartment house to be erected on Seventh avenue. Mr. Schwerdt has also made plans for two Exposition buildings, one for the Republic of Honduras and the other for the Republic of Guatemala. The two buildings will cost about $20,000 each.

ARCHITECTS CUNNINGHAM & POLITEO, First National Bank Building, have prepared plans for several new buildings to be erected at Davis, Yolo county, for the Agricultural Department of the University of California. The buildings will be of brick and concrete and will represent a total outlay of about $100,000.

ARCHITECT WILLIAM BINDER, San Jose, has made plans for a reinforced concrete addition to the Keystone Company's warehouse. Mr. Binder has also let contracts for the completion of the Town Hall at Santa Clara. Plans have been prepared in the same office for a $5,000 residence for Dr. Edward Newell of San Jose.

Competition for Portland Post Office Building

In accordance with section 6 of the Public Building act of March 4, 1913, the U. S. Treasury Department will hold a competition for the selection of an architect for the new post office building at Portland, Ore. The cost of the structure is limited to $1,000,000, including architect's fees, but exclusive of site. The following architects have been invited to enter the competition and have accepted the invitation: Doyle & Patterson, Portland, Ore.; Lawrence & Holford, Portland, Ore.; Whitehouse & Fouilhoux, Portland, Ore.; Bliss & Faville, San Francisco, Cal.; John Russell Pope, New York City; Clinton & Russell, New York; J. H. Friedlander, New York City. Designs are to be submitted on October 6, 1913.

* * *

Competitors Invited to Withdraw

Pacific Coast architects who were invited to draw plans for the new $1,000,000 Portland postoffice have recently been advised that the invitations have been withdrawn. The notification came directly from William G. McAdoo, Secretary of the Treasury.

Portland architects declare they were debarred from submitting drawings following a request for a hearing at which some of the provisions might be discussed with a view to modification.

Seven architects of Portland, San Francisco and New York were asked by the Secretary of the Treasury to submit drawings on the new edifice. It was stated that six of these firms, including all three of Portland and one San Francisco firm, have been ordered to withdraw, leaving only one New York firm to do the work.

In addition to the three Portland firms, Bliss & Faville of San Francisco, John Russell Pope and J. H. Freedlander of New York have been ruled out by Secretary McAdoo.

As all the firms asked to compete had commenced preliminary work on their drawings, it is said they will have good ground for suits against the government.

Personal

Joseph Losekann, formerly head draughtsman for Architect Walter King of Stockton, has received a certificate to practice architecture from the California State Board and has opened offices in the San Joaquin Building, Stockton. Mr. Losekann will be pleased to receive catalogues and trade literature.

Architect Charles S. Kaiser of San Francisco and Sacramento has returned from an enjoyable trip east. Mr. Kaiser visited his old home in the Green Mountain State and also took in all the architectural wonders of the big eastern metropolis.

Rixford Wins Victoria Hospital Competition

Loring P. Rixford of San Francisco, winner of the Bohemian Club competition, and who was architect of the Union Club building in Victoria, has been placed first in the competition for the Royal Provincial Jubilee hospital. The prize plans receive a premium of $1,500.

Somervell & Putnam of Vancouver were given second place and James & Davidson of Vancouver, third. The second premium is $1,000 and the third $500.

The awards of the advising architect, J. D. Atchison of Winnipeg, were adopted by the board of directors of the hospital on the ground that the three sets had most carefully considered the arranging of the hospital to assure convenience.

In his report Mr. Atchison said: "There were fifty sets of drawings, all of which complied with the requirements of the programme, and many were of such exceptional merit that I had great difficulty in making a final selection. Each of these designs shows that the author has made a careful study of this particular problem as well as the administration and design of hospitals in general. In closing I wish to congratulate you on the number of meritorious designs submitted, as a result no doubt of the conditions of competition as prepared by you."

It is understood Mr. Rixford's plan is the most economical, exhibiting besides the fullest knowledge of the site and its possibilities. It has also a dignified front elevation towards the cricket ground.

Loring P. Rixford will now be appointed supervising architect. He has been in practice since 1907 in San Francisco, and is a graduate of the Ecole des Beau Arts at Paris. He was city architect for some time in San Francisco, and among his important buildings are the Bohemian Club and the San Francisco City and County General Hospital.

Big Warehouse Planned

It is stated on excellent authority that the Bush Terminal Co., 100 Broad street, New York, is planning to erect a large reinforced concrete warehouse for manufacturing plants on the San Francisco water front. The building will be erected some time in 1914 and the preliminary work is now being done by Engineer H. J. Brunnier, Sharon Building, San Francisco. It is stated the company will spend $200,000.

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BANKS BLAMED FOR DULLNESS IN BUILDING

The comment on dullness in building operations in San Francisco and Los Angeles, owing to the impossibility of securing the necessary loans, calls to attention that practically the same condition prevails all over the country. At the present time money is scarce and loans hard to be secured, even on gilt-edged security. The statements of the savings banks show that the banks are not hoarding their money, the cash on hand being about the average amount. It seems probable that the present stringency will continue but a few months longer, as it is recalled that in 1907, when a similar stringency was felt, it was but a few months from the almost impossibility to secure a loan to the time when money was plentiful. It is understood that the national banks at the present time are securing in many cases 6½ and 7 per cent for gilt-edged commercial paper.

There is hardly an architect in San Francisco who has not one or more clients ready to build as soon as the banks "loosen up." Many buildings which ought to be under construction now, if they are to be finished in time for the Exposition crowds, are being delayed and the result will be that when money is again plentiful there will be such a rush of work that to supply the demand materials will be advanced and the owner will have to pay inflated prices just as he did during the building rush which followed the earthquake and fire. Loans made now would enable the owner to build a better building for less money while loans made a year from now will permit him to build a poorer building for more money. And in the meantime hundreds of mechanics are idle, collections are poor and failures are all too frequent.

EXITS OF CROWDED BUILDINGS

Anent the recent Binghampton factory fire in which so many lives were snuffed out almost in a twinkling, the question of providing adequate exits is worth serious discussion. Architects and engineers ought to study the question and in planning the public building or factory of the future, they should make provision for emptying the structure of its human occupants with the least possible delay.

One of the most hopeful suggestions to this end is the plan proposed by H. J. F. Porter, a consulting engineer of New York, at the Baltimore meeting of the American Society of Mechanical Engineers. He proposes, in brief, a fire wall penetrated on each floor by two or more fire doors, dividing the factory building into two parts, each of which would have exits adequate for the whole population of the building. At the alarm the first business of those in authority would be to get everybody out of the threatened half and see to the closing of the protective doors, which once accomplished would in all probability give ample time for a safe exit, the chances of fire starting simultaneously on both sides of the party-wall being remote. How far this plan could be adapted to existing buildings Mr. Porter does not discuss in his interesting paper, which Engineering News prints in a recent issue, but for new construction it is well worth considering. Even where a considerable degree of inflammability exists it should give a great increase of safety provided the protective doors are well looked after and the people frequently drilled in going instantly from one side to the other.

Specially noteworthy is the stress which Mr. Porter puts upon the rapid increase of danger as buildings are made higher. Great as is the danger in the usual type of factory building in towns where land is cheap the risk is far greater in the high loft buildings of New York. The author shows the strict limitations upon the capacity of a staircase, and how that capacity is reduced by the confusion of the streams from several floors. It takes ten seconds per floor, on the average to descend, and "it is a physical impossibility for people to stand the exertion of a trip down more than ten stories without resting, and when they stop to rest they block the stream and obstruct its exit." That in many cases the exits installed are not adequate and would fail if a test came is the opinion of Mr. Porter, who says:

> This situation has probably developed with the rapid growth of industry where a factory building had been built to accommodate a certain number of people, and then, as the business grew, more people were accommodated without realizing that each additional person became an increment of danger to all. Or, if the danger was at all appreciated, some means of escape from windows was supplied which might be anything from a rope to a ladder. After this condition had become general it crystalized into custom, and new buildings with exit facilities inadequate for their occupancy were designed, erected and accepted as safe. Ropes were followed by ladders, and these in turn by fire escapes which became in time an established necessity.
>
> Engineers, when called upon to supply a mechanism, are expected to have it subjected to a working test, which it must pass before they get paid for it; but architects and builders have never been called upon to demonstrate by actual test that the facilities which they have supplied in their buildings for the purpose of emptying them under emergency conditions will actually work, and this notwithstanding repeated instances of panic congestion on stairs, of people being burned to death on fire escapes, of elevators sticking from the warping of their runways from heat, etc.
>
> When subjected to test, these exit facilities in many buildings have been found to be entirely wanting in adequacy, and when this fact was brought to the attention of those who were responsible, it has been surprising to find how readily they accepted the criticism. On the other hand, those who possess these unemptiable buildings are skeptical of such statements and unwilling to be persuaded that the buildings are not safe. They point to all the other buildings erected by reputable architects and builders and naturally are incredulous.

State, County and Municipal Engineering

Good Roads—Water—Sewers —Bridges—Fire Protection

Progress on the San Francisco Civic Center Group

With the recent arrival of five carloads of structural steel to be used in the construction of the new San Francisco City Hall, activity in the work on the civic center has been given a new impetus. The amount of steel already received aggregates 256 tons, and the material is now on the site of the City Hall.

The steel is being furnished by the United States Steel Products Company, the contract amounting to $357,941. This is for 7400 tons of steel, which, according to the estimates, is the amount that will be required in the erection of the new municipal building.

Excavation and grading on the site have been completed. It is estimated that 30,000 cubic yards of soil was removed for this work. The Contra Costa Construction Company has the contract for the work, amounting to $23,950.

The foundation work for the building is more than a third completed, and just as fast as the progress of this will permit the steel work will be put up. The foundation work is being done by the Sound Construction Company, the contract being for $44,882. The erection of the steel frame is to be done by the Blume Construction Company at a cost of $80,000. This averages about $10.60 to the ton, including the painting of the steel. The contract for the granite work has been let for $991,313. The company will furnish Raymond granite, a home product.

The work of crushing brick and stone on the site of the old City Hall, the materials to be used in the ground-work of the new building, is progressing rapidly. The approximate cost of this is $30,000. There are 3,000,000 bricks to be cleaned, 10,000 yards of brick to be crushed and 7200 yards of stone to be crushed before the work is completed.

Contracts will be awarded shortly for the terra cotta and masonry work. It is estimated that this will cost somewhere in the neighborhood of $110,000.

The Panama-Pacific International Exposition Company, which has charge of the construction of the auditorium on the civic center site, is rushing this undertaking along with all possible speed. The building is to cost $1,100,000, and it is the intention of the Exposition officials to have it completed by 1915 in order that the auditorium may take care of many of the big national and international congresses and conventions which will meet in San Francisco in that year.

The grading and concrete work on the auditorium site is far ahead of the contract time. The work is to cost $70,000. The first consignment of steel to be used in the structure has arrived. The United States Steel Products Company is furnishing this for $164,835. The erection of the steel has been awarded to the Blume Construction Company for $39,900.

One Automobile for Every Two Miles of Road

There are 1,100,000 automobiles in America, or one for every two miles of country road. If all the steam locomotives (passenger and freight) were placed at equal intervals in the railway lines there would be one locomotive for every fourth mile. There are about as many passenger cars as there are locomotives, and twenty times as many freight cars as passenger cars; but all the freight cars, passenger cars and locomotives combined total only twice the present number of automobiles, and probably did not cost more than as much as all the automobiles.

The array of automobiles is astonishing when comparisons of this sort give us comprehension of the increase in the number of this type of vehicle. And the output of the motor car factories continues to increase in geometric progression.

To the civil engineer and to the contractor the main significance of these facts is this: The building of roads and street pavements is certain to become an industry of great proportions. Hitherto road building has been a relatively insignificant industry in America. But a great change is being accomplished by the development of the motor car.

Having rapidly displaced horse-drawn carriages in urban districts, the motor car is now fast displacing horse-drawn vehicles in the same districts. The next step will be to do away with horses on the farm for almost all purposes except plowing perhaps. We add "perhaps,"

for motor trucks equipped with gang plows are already in successful use.

Will the increasing use of automobiles and motor trucks result eventually in the building of parallel roads, one for heavy, slow-moving loads, and the other for fast passenger cars? We think so. Just as the growth of traffic on railways has resulted in separate tracks for freight and passenger cars, so will a dense motor car traffic result in the building of separate roadways for the two kinds of traffic—passenger and produce.

Will roads for motor trucks develop into railways, in which the rails will be flanged instead of the wheels? This is not very probable, but it is not unlikely that broad, flat rails may be laid on motor truck roads. Because such rails were a failure on roads traveled by horses does not follow that failure will attend the use of rails on motor roads.

The invention of the steam locomotive resulted in the decadence of highway engineering. The invention of the automobile, a century later, is the cause of a great revival in the branch of engineering made famous in England by John Macadam, and long before him in Europe by Roman engineers at a time when nearly all engineering was military.

$4,200,000 Already Subscribed for the Ocean-to-Ocean Highway

"The most colossal project yet undertaken in behalf of the motorist," says the Commercial Tribune, "is the Ocean-to-Ocean highway, started two years back through the efforts of Carl G. Fischer of Indianapolis, and so far advanced in its plans that a number of Ohio parties are thus early forming preparations for its use on a 25 days' motor trip to San Francisco for attendance on the Panama-Pacific Exposition of the year 1915.

"That the automobile industry will experience unprecedented impetus from the completion of this transcontinental thoroughfare is being foreseen by every manufacturer of note.

"Permanent headquarters for the Ocean-to-Ocean Highway Association have just been opened at Detroit, Mich., and of the $10,000,000 required for its building, $4,200,000 have already been pledged."

Santa Rosa Jail

Architect J. W. Dolliver of San Francisco has completed plans for a two-story reinforced concrete jail to be erected at Santa Rosa at a cost, including furnishings and equipment, of $75,000. Bids are now being received and will be opened by the Supervisors on October 7th.

State Farm Improvements

Architects Cunningham and Politeo of San Francisco have completed plans for extensive additions to the teaching and living accommodations at the University State School Farm at Davis.

A new dormitory, to be built from the special appropriation of $40,000 made at the last session of the Legislature, will be the largest structure to be added to the group of farm buildings. The cost of construction will be $36,000, and the remainder of the appropriation will be used for furnishings. The building will contain a large living and recreation room, basement quarters and seventy-two bed rooms.

A class room building, which will be the first brick structure to be built at the Farm, is another improvement provided for by legislative appropriation. This building will contain an auditorium with a capacity of 600, a stage and facilities for making it a general gathering place for the faculty and students.

Additions to the present dining room will more than double its capacity. This building item will amount to $12,000. An office building, to cost $3,000, a machine shop for the courses in farm mechanics and a poultry laying house will also be constructed as soon as contracts are awarded.

Big Moving Picture Plant

James Keene, an Eastern moving picture producer, has come to California from New York with plans for a new $250,000 studio which he intends to build somewhere in the State.

San Rafael, Alameda, Berkeley, San Leandro and San Jose, through representative business men, have offered Keene various concessions and their co-operation if he will build his plant near their town.

The new company is being backed by Eastern capital in a large measure, and by some California capital. Feature films devoted to showing scenery of Northern California will be taken. There will be over one hundred actors employed the year round producing dramas pertaining to the early history of California.

London's New Home Burned

Jack London's new country residence at Glen Ellen designed by Architect Albert Farr of San Francisco was destroyed by fire August 22. London and his wife are occupying an old farm house. The loss will be $50,000.

The house was built of stone and redwood logs, after ideas suggested by the novelist. It covered a ground area of 80 feet square and in the center was a large court. The interior was beautifully finished in expensive hard woods.

None of the London's belongings had been moved into the house, although they expected to occupy it in a few days.

World's Greatest Exposition Two-Thirds Completed

At this time, one and one-half years before its formal opening day, February 20, 1915, the Panama-Pacific International Exposition is more than two-thirds completed. This estimate is based upon the total amount of work necessary in the complete preparation of the Exposition. Every department of the Exposition is pronounced by executives familiar with the organization of universal expositions to be further advanced than were those of any of the greatest expositions held in America at a similar pre-exposition period. Twenty-seven of the world's nations have accepted the invitations conveyed through the Department of State; this record is unprecedented at a time one year and one-half before the opening. Thirty-five States have selected sites for State pavilions. Almost seven thousand applications for concession privileges have been received. The applications for exhibit space would, if all were granted, exhaust the entire exhibit area.

Construction is far advanced. The most difficult part in exposition building is past. An immense amount of preparatory work has been accomplished. Ten of the fourteen huge exhibit palaces are now under construction. One building, the service building, is completed. Contracts for three additional buildings will be let within a short period.

All buildings are being built under time contracts with definite limits for their completion. A number of the most noted sculptors in America have advanced far in the preparation of the sculptural models to be reproduced upon the Exposition grounds. Under the direction of Mr. A. Stirling Calder some of the most important models are being enlarged in the sculptural warehouses.

A phase of the Exposition in which it will stand alone among all great expositions of America and Europe will be found in its representation of the South and Central American republics. These nations will participate upon a great scale.

More than 140 great congresses and conventions, many of them of international interest and importance, have voted to meet in San Francisco in 1915. This number will undoubtedly be greatly augmented. Many conventions will not take final action until 1914 owing to a usual custom to choose the annual meeting place but one year in advance of the time of meeting. To accommodate these great bodies, which will bring together many of the world's most brilliant minds, the Exposition company voted $1,000,000 for an auditorium at the civic center. First work upon this building has started.

About 3,500 men are now employed upon the Exposition grounds. The esplanade, to lie before the main exhibit palaces, has been sown to grass; the freight ferry slip at the eastern end of the esplanade is completed and work on the passenger ferry slip is under way; the yacht harbor at the opposite end of the esplanade is practically finished; a considerable portion of the grounds is under railway track and within a short period cargoes may be unloaded at the freight ferry slips and transported by rail to any part of the Exposition grounds. The Exposition company operates its own railway.

New Council of Quantity Surveyors

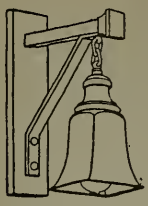
A number of San Francisco architects, engineers and contractors held a preliminary meeting at the Palace Hotel in August for the purpose of considering matters of interest appertaining to the quantity system of estimating, and to arrange for a San Francisco Council of the American Institute of Quantity Surveyors, a national association now in course of being established by persons interested in this subject throughout the United States. The meeting was called to order by Mr. William Mooser, who opened the proceedings with a brief outline of the present conditions of bidding, and the principal aims and objects of those who are interesting themselves in an effort to bring about a better method of estimating throughout the United States. Organization was effected and the following temporary officers were elected to serve until by-laws were framed and adopted, viz.: President, William Mooser; vice-president, G. Alexander Wright; secretary and treasurer, William H. Ferguson.

The objects of the society are to encourage better methods of estimating and dealing with bids, and to provide a forum where architects, engineers, contractors and others may, as associate members, meet upon common ground and discuss methods of bidding upon contract work, and similar problems affecting the cost of buildings.

Uncle Sam Will Not Recognize Sub-Contractors

The U. S. Treasury Department recently announced that it would insist that contractors on public buildings hereafter must look after the financial wants of their sub-contractors as work on the structures progressed.

In the past the department has experienced trouble in pushing work on new buildings because contractors in their monthly requisitions for funds failed to make proper payments to sub-contractors. This practice, the department proposes to end and it will try out its new policy in the erection of the new $400,000 federal building at New Haven, Connecticut.



Heating and Lighting

Plumbing and Electrical Work

Electrical Equipment of San Francisco Hospital

By C. F. BUTTE*

THE importance and extent of an electrical installation within hospital buildings is of sufficient interest to warrant a description of that in the new City and County of San Francisco Hospital. The buildings are situated in the form of a cross, the power house, service building and laundry in the rear forming one leg, the receiving building, ward buildings and nurses' home, forming the center leg and the administration building forming the front leg. The distance from the receiving building to the nurses' home is 860 feet with one continuous corridor 780 feet long. The administration building is 79x171 feet, three floors and basement; the power house 185x99 feet, two floors; the receiving building 204x111 feet, five floors and basement, and four ward buildings, each 212x30 feet, four floors and basement; service building 171x109 feet, three floors and basement and nurses' home, 148x84 feet., three floors and basement.

The service conduits feeding these various buildings enter the power house through a tunnel and thence to the various main switchboards through the basement corridor. The tunnel from the basement corridor to the power house is 230 feet long and the basement corridor is 782 feet making a total run of 1012 feet.

The necessity of an absolutely reliable source of power in a hospital has been well taken care of by four 500 amp. 125-250 volt generators, each direct connected to steam turbines, with rated capacity of 125 kw. at 2400 r.p.m. working under 150 lb. steam pressure. The boiler plant consists of four banks of Risdon water tube boilers equipped with Foster super-heaters and Dahl oil burners. The oil tank has a capacity of 11,400 gallons. In addition to all of the above units, an emergency service has been provided on the power house switchboard to throw in any outside source of supply that may be installed.

The power house switchboard consists of 11 panels, namely, 5 generator panels (1 panel for a future unit), 1 main lighting and 1 main power panel, 3 lighting feeder and 1 power feeder panels and is 24 feet in length and 7 feet 6 inches high. The main busbar switches have a capacity of 8000 amperes

City and County Hospital, San Francisco

*Read before the Electric Development League of San Francisco.

From the power house switchboards separate light and separate power feeders have been provided to each and every building. These feeders conect to the rear of the power house switchboard through a large pull-in box directly beneath. This box is 2 feet by 2 feet 6 inches and 22 feet long, made of heavy boiler plate and wherein all jumping is done in order to bring out the feeders in regular rotation to their respective switches. From this point the feeders connect to individual main switchboards in each building, eleven in number and consisting of a blue Vermont marble slab, with a main power and light switch and sub-feeder switches for each panel board in the respective building, requiring 152 polished knife switches, ranging from 30 to 400 amperes. There has been installed 6500 feet of feeder conduit ranging from 1 to 3½ inches, for these feeders, using 18,000 feet of feeder wire ranging from No. 8 stranded wire to 600,000 c.m. cable.

From each of the above switchboards individual sub-feeds are run to each panel board located on the various floors. These panel boards are 47 in number and range from 10 circuits to 32 circuits. The total number of panel circuits is 614, ramifying to 4160 light outlets and 61 motor outlets ranging from 1/6 to 35 horsepower.

The total number of feet of conduit used in this installation in size from ½ to 3½ inches is 136,860 feet. In branch circuit work alone 108,600 feet No. 14 duplex wire is installed and 32,100 feet of telephone wire.

Particular care has been taken with the telephone systems which are throughout installed in conduit work. Three individual runs are provided to each station, one for public phones, one for private and one for a special house system to be installed later. Ninety-nine stations have been installed with provisions for 120 more.

In addition to the telephone systems, conduits have been installed for a visual doctor's call system with 24 stations, one at each cross corridor of each floor, to call any doctor or interne from the main office. The system will consist of double-faced luminous indicators at each point which will illuminate simultaneously any number or numbers throughout all buildings at one time at all of the 24 stations and will be controlled from the main office in the administration building. A buzzer system has also been installed with buzzers at 24 different points similarly located as the visual system outlets.

These buzzers can be rung from the main office either all 24 at one time or each building individually and can be used for a program system or in place of the visual calls. The buzzer system is operated from a 6 cell, 40 ampere hour storage battery located in the battery room.

In order to provide means for the patients to call the nurses a silent visual call system has been installed. Over each and every bed a special signal light has been placed and connecting therewith is a call switch at the end of a 6 foot cord. In addition to this light, a light has been placed over the ward door both inside and outside, another light at the nurses' desk and one in each diet room.

If the patient presses the call button, it automatically locks itself and lights the lamp over the bed, operates a relay which lights the lamp over the doors, at the desk and in the diet room. To further protect the patient a master annunciator is installed in the main office which indicates the calls not answered in any or all of the wards, thereby indicating to the superintendent whether the calls are attended to. The call switch at the bed requires a key carried by the nurse to reset it for another call, thereby compelling the nurse to go to the bed before any light can be extinguished. Five hundred and twenty-seven silent signal call stations have been provided. This system is operated on 110 volts direct from the lighting mains and will operate on either direct or alternating current.

The time elements have also been fully taken care of by the installation of a complete electric clock system consisting of 78 stations. The clocks are all set flush with the wall and have a 12 inch white marble dial with bronze numerals and hands. These clocks are operated from a four circuit master clock in the superintendent's office. The current for the clocks is provided by 25 cells of storage batteries, which are in duplicate to obviate any interruption in the service. Each bank of cells is capable of operating the clocks for one week. A charging panel with necessary switches, meters no-voltage release and rheostats to charge for the 110 volt circuit has been provided. A separate room has been set aside for this equipment and which has been arranged in a very satisfactory manner.

Semi-indirect lighting is used for the wards with dust-proof covers over the bowls. While the hardware and switch plates are all nickel on account of wear, the fixtures are white enamelled and with plain lines. All ornamentations have been omitted to prevent dust collection. The fixtures in the operating rooms will be adjustable and can be set in any position. In these rooms an additional precaution has been taken by the installation of gas outlets.

In the hydro-therapeutic room, an electric cabinet, an electric bath and a galvanic and faradic treatment coil has been provided. All the electrical construction was performed by the Butte Engineering & Electric Company.

The Abuse of Plumbing Fixtures

All too often the plumbing manufacturer is blamed, and claims are made for defective material when conditions such as are set forth are responsible for the damage. This letter is from a manufacturer's representative:

"The other day I was called in to look at a couple of tubs installed in a very fine apartment building. In this job were twenty-six (26) high-grade tubs. I was surprised to see the condition of the fixtures generally, as the tubs were most all covered with lime and mortar left by the plasterers and tile setters. On at least three of the tubs it was almost impossible to see any enamel, and I am of the opinion that when this debris is removed the surface will be affected.

"The lavatories are also in very bad shape, as most of them show where the painters have cleaned their brushes in them. I took this subject up with the plumber, and he stated that after he set each fixture he covered both tubs and wash stands with paper, but that the plasterers, carpenters, painters and other tradesmen on the job removed the covering. It is my opinion that a more substantial covering should have been used; one that would have required more effort to remove, such as a tarpaulin or canvas covering. Paper is not sufficiently strong and too easily removed to be of any real value for this use. I next took the matter up with the general contractor and pointed out to him the shame of abusing bath room fixtures in this manner, and he stated that it was something beyond his control, and was up to the individual or sub-contractors.

"I have no doubt but what more care will be taken on future jobs by the people whom I talked to in this particular case, but to take up each individual contract and attempt to guard against this abuse is something out of the question.

"On the same job I was walking over a hardwood floor and was cautioned by the man laying it to walk on my toes and not with the heels of my shoes, yet apparently no care was thought to be taken about porcelain enameled lavatories and bath tubs."

This case was clearly one where the plumbing fixtures were installed before they should have been. The plastering and all similar work should have been completed before the fixtures were even taken to the job, and there would have been no possibility of such damage being done.

Heating Dwellings by Electricity

The city of Seattle has recently made provision for heating dwelling houses by installing electric heating coils under the hot-water boilers and individual radiators in the houses of those who order the service. The heaters are automatically controlled by a device which cuts off the current when the heat reaches the desired degree and turns it on again when the temperature falls below a certain degree. It is said that these heaters provide a satisfactory amount of heat at a less cost than coal.

NOTICE TO ARCHITECTS

Kern County Jail

Public notice is hereby given that plans and specifications in detail, for an absolutely fireproof jail for Kern county, California, will be received by I. L. Miller, County Clerk and Clerk for the Board of Supervisors of Kern County, up to 10 o'clock a. m. of the 7th day of October, 1913. Plans, elevation and sections must be drawn to a scale of eight feet to one inch, and be executed in black and white only. Building site is 264x264 feet. A perspective may be submitted.

Specifications must be complete and contain a complete system of heating, plumbing and ventilation, and must specify kinds of material used in construction. The plans must be for a building two stories high and basement.

The successful competitor must file a good and sufficient bond, satisfactory to the Board of Supervisors, in the sum of $2,500.00 as a guarantee that a bona fide bid, for a sum not to exceed $150,000.00 for the construction of said building as per plans will be received at the time appointed for such bids.

Premiums will be given to competitors as follows, to-wit:

First prize, acceptance of plans and specifications.

Second prize, two hundred and fifty dollars.

Third prize, one hundred and twenty-five dollars; all of said premiums to be deducted from the commissions paid the successful architect.

The Board reserves the right to accept or reject any or all plans and specifications.

Dated this 13th day of August, 1913.

I. L. MILLER,
Clerk of the Board of Supervisors.
By GEO. H. BRUNDAGE,
Deputy Clerk.

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Contractor Must Keep Cost Within Contract Price.

When a contracting firm enters into a contract to erect a building for a certain sum, and the costs exceed the amount stipulated in the contract, they, and not the owner, are responsible for the extra outlay. This, in brief, is the decision rendered by Judge Lampham, in the case of sub-contractors vs. the Westholme Lumber Company, general contractors, for the erection of the new Campbell building, in Victoria.

The court held that the Westholme Lumber Company was not acting as agent for Mr. Campbell, the owner of the building, and absolved the owner of the property from liability for the amounts due sub-contractors of the Westholme Lumber Company. The plaintiffs could get judgment against the contractor, but not against the owner of the property.

Pythian Castle for Stockton

The Stockton Knights of Pythias, about 400 strong, are planning for a Pythian building to be erected on their property on the east side of American street, between Main and Market. The building will occupy a space 50 by 100 feet, three stories high, and cost about $50,000. The building committee consists of Charles Ball, A. Barnes and Nick Tickvitza, trustees of the order.

The first story of the proposed building will be devoted to store space, the second will be modeled into offices, while the third floor will house the Knights of Pythias. Aside from a spacious lodge room, this floor will also contain magnificent Pythian club quarters.

Concrete Stadium for Stanford

At a recent meeting of the Associated Students of Stanford University it was officially announced that it had been decided to build a concrete stadium to take the place of the present football field.

The stadium will be situated north of the track oval. The field will be excavated and

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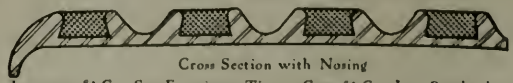

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the dirt thrown up on each side to form a base for the concrete seats.

According to the plans of the building committee, the stadium will seat about 20,000 people, and will be constructed with a promenade at the top, providing standing room for from five to ten thousand more. It is estimated that the stadium will cost about $60,000. Plans and specifications for a new gymnasium are also under consideration and will be submitted to contractors Saturday. It has been proposed to build the gymnasium in the shape of an L on the present site of the athletic fields.

Class A Building

The Pacific Telephone & Telegraph Co. is having plans prepared by its San Francisco engineering department for a Class A building to be erected on the site of its present building at 622 South Hill street, Los Angeles. The building is being designed for twelve stories, but only six stories will be erected at present. The new structure will have a frontage of about 75 feet on Hill street and will be about the same depth. The construction will be steel frame with reinforced concrete floors, brick filler walls, terra cotta facing, hollow tile partitions, composition roof, steam heat, elevators, plate glass fronts.

Too Many Apartment Houses

(From San Francisco Wasp.)

The bankers here are discouraging builders who wish to erect more apartment houses. The example of New York is a warning. A lot of money has been sunk in New York apartment houses and cannot be got out. San Francisco bankers now have to be shown very clearly that a new apartment house has a first-class location before they will lend a cent towards the building. Extreme caution is exercised in lending on this class of construction.

Upper Market street, to which The Wasp has called attention before as a likely place to make a turn in real estate, is beginning to show genuine signs of advancing. Still another five-story apartment house is going up opposite Gough street. The large middle-class apartment house erected recently in the neighborhood by Chas. Crocker is a paying investment, and is a good example of far-sighted financiering.

Getting Ready to Fill State Cement Contract

(From the Santa Cruz Sentinel)

General Manager Leh, of the Old Mission Portland Cement Company at San Juan, has returned from his travels in the East, and is now busy superintending the preparations for gigantic operations in the near future.

Mr. Leh stated that no further obstacle remained to deter an immediate commencement of operations.

"In three weeks," said Mr. Leh, "we will have everything going ahead in first-class shape. As soon as all bids have been submitted, and the contracts let for extensive constructional work things will assume a lively aspect.

"In less than a year from today there will be at least 300 men working daily at this manufacturing plant and, believe me, San Juan will certainly be a busy little town.

"Tell the people that there is a big future before them, bigger than they ever dreamed of. We are planning for extensive operations, not only in San Juan, but all over San Benito county.

"It is a big thing and we will push it through. And it will go. It's got to go."

Obviously impressed, Mr. Leh continued: "I have just returned from New York and Chicago. Our president is still East completing several matters of important business. I do not expect to go away again, having finished my work and will be here indefinitely."

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By the Way

Some Industrial Information Worth the While

Tons of Dust from the Cowell Plant

Approximately 42½ tons of cement dust escapes every twenty-four hours from the eight stacks of the Cowell Cement works in Contra Costa county, according to the expert and thus far uncontradicted testimony of Professor Robert E. Swain in his testimony before the court at Martinez.

The figures which were presented in the form of charts by Professor Swain were truly amazing, says the Contra Costa Gazette for while Contra Costa people know that there is a considerable quantity of dust escaping from the works while in operation very few realized that such a great quantity is daily being sent forth from the stacks and allowed to settle over the surrounding farming region. There are eight of the mammoth stacks at the plant and with all eight in operation and the plant running to capacity the above tonnage escapes each day.

The tests were made by means of pilot tubes, meters and mercury manometers to register the tonnage, velocity and quantity of the gases.

A Beautiful Brick Exterior

The Sacramento Sandstone Brick Company reports a steady demand for its face brick. Since the completion of the Hotel Sutter, architects who have seen the building have only praise for the beautiful appearance of the exterior. Some at first would not believe the brick was of the sandstone type—they are so smooth, even and warmly toned. Two contracts that are now being filled and which give promise of being quite as satisfactory as the Hotel Sutter job are the new hotel in Modesto and the Travelers' Hotel in Sacramento. The latter is now nearing completion. It is of the reinforced concrete type with brick veneer face. Among the San Francisco architects who have used Sacramento sandstone brick with satisfactory results are Reid Bros., Herman Barth and William H. Weeks.

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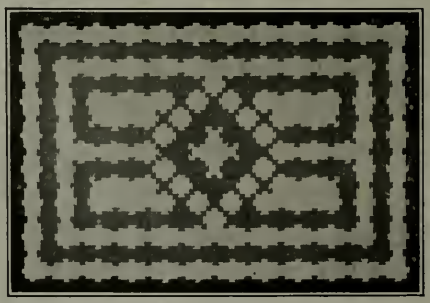

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We find upon investigation that many progressive cities are adopting the rule of equipping all schools, both old and new, with the Von Duprin Self-Releasing Fire Exit Devices, as it seems that school boards who have knowledge of a device of this character and do not use it are being held personally responsible for any deaths or injuries received.

Theaters, auditoriums and other buildings of this character where public assemblies are held, are using the Von Duprin devices wherever possible.

Coast cities are following the example set by the East and are equipping both schools and theaters with the Von Duprin patents.

Wanted—A Hotel

Pomona is in the market for a modern hotel building and if the Chamber of Commerce of that city can find anyone or a syndicate which will erect a $250,000 modernly appointed structure such as will appeal to tourists, stands ready to offer a cash bonus of $50,000. The chamber has endorsed the recommendation of its hotel committee to take over the option held by Dr. W. F. Fundenburg of Pasadena on the site of the former Pomona tavern, which burned a year or so ago. This site occupies an entire block on North Garey avenue north of the railroad tracks and business section. Dr. Fundenburg for some time talked of building a fine reinforced concrete hotel, but lately offered the opportunity to the Chamber of Commerce. The option holds good until October 1.

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Art in Building

San Francisco's artist colony has recently received an accession, in the person of Senor A. Rodriguez y Villar, a noted Spanish sculptor, who has established a permanent studio in the California metropolis. For the past four months he has been employed in executing a commission for Willis Polk. Senor Villar came to the United States in 1909, establishing a studio in New York. Here he was commissioned to make twelve statutes for the church of St. John the Divine, the new Episcopal cathedral, which is conceded to be the most beautiful church edifice in America. The monument symbolizing universal peace, in this cathedral, is Senor Villar's most elaborate work. The base represents Atlas, and rests upon an irregular foundation symbolizing the cross. The cornice represents, in profile, the eagle, king of birds, and the lion, king of beasts; from the lateral part of the base appear three distinct groups: First, Light, opening the way for Peace; second, Intelligence, in advance, with Ignorance behind, mounted on horseback and urging his horse forward, but the horse balks, as it recognizes Intelligence; third, the True Life, a group of three figures, Philosophy, Science and Labor. Around the sides of the base are four figures, representing Earth, Water, Fire and Air. The body of the monument shows the five continents united by clasped hands. Europe and America are embraced; Asia, Africa and Oceanica in different poses, and the Sun of Truth, illuminating a new world of Peace and Brotherhood. At the four points of the compass are four female figures, which also represent the four seasons. The head of the monument is represented by the figures of all religions, surrounding Truth, which is in the form of a woman holding a skull (Wisdom) in one hand, and advancing upward to the Angel with the nine-pointed star and the olive branch leading to Unity.

Monument Symbolizing Universal Peace

Undoubtedly, Senor Villar is one of the most eminent sculptors of the times. He has executed work for the governments of Spain, Italy, France, England and Turkey, and the art museums of New York and Boston have secured copies of some of his European works.

City Beautiful Scheme for Sacramento

The Sacramento Chamber of Commerce City Planning Committee has decided to ask the City Commission to include $15,000 in this year's budget to

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be used in furthering the plans of the "city beautiful" workers.

The City Planning Committee also decided to appoint a committee of 150 to work for a "City Beautiful" in Sacramento.

Those present at the meeting were C. M. Goethe, chairman; C. H. Dunn, C. A. Titus and Architect R. A. Herold. John W. Woollett, former State Architect, addressed the meeting in favor of securing a large appropriation for carrying out the work

Woollett emphasized the importance of having the $15,000 included in the budget.

"I have made a close study of city planning," Woollett said, "and I have found that wherever a city planning committee was appointed and no money was appropriated no definite action resulted. Meetings were held and there was much talk, but nothing was accomplished. The committee must have the money to do the work with, and the result will be a city plan, which will mean great things for Sacramento."

Notes from the Gravel Men

The Grant Gravel Company of San Francisco is keeping its gravel pit running at full capacity, some difficulty being experienced from the scarcity of water. The company's business is largely in washed gravel for use on State highway contracts, though the company also furnishes a large amount of roofing gravel in this city, selling only in carload lots.

The Pratt Building Material Company, San Francisco, is making good headway with its sand and gravel business, and reports a number of large contracts for concrete aggregate. One of the largest orders is for the concrete lining of the Union Oil Company's new reservoir at Oleum, near Martinez, Cal., which will be about the largest oil reservoir in the world This job will take about 200 carloads. Another interesting contract is for about 100 cars of washed gravel to be used in a concrete mausoleum at Woodlawn cemetery, to be called Woodlawn Abbey, south of San Francisco. The building will be of solid concrete faced with Utah manti. From its Austin Creek pit in Sonoma county this company is shipping all gravel and sand for a concrete bridge, roads and sidewalks in the new town of Woodacre, in Marin county.

Big Improvements at Monterey Presidio

Improvements, estimated to cost $300,000, are planned for the Monterey Presidio. These improvements, made necessary for the accommodation of new forces to be stationed at the post, include the extension of the present quarters, the construction of a number of additional stables and the improvement of the grounds.

The American says: "The new stables, some eleven in number, will be located in the hollow of the hill between the Serra and the Sloat monuments, which will make them practically invisible from the road.

"The plans for the new buildings have been prepared and the work will soon start. The government has made a marked change from its past custom in such matters, in that the work will not be let out on bids, but will be done by day labor under the direct supervision of the quartermaster. All competent local people will have an opportunity to share in the work, under favorable conditions. Large quantities of cement will be used as most of the present buildings will be raised and concrete foundations placed under them.

"The Book of 100 Houses"

"The Book of 100 Houses," is the name of the latest publication from the well known house of Samuel Cabot, Inc., Boston, Mass. Cabot's Creosote Shingle Stains which have a world wide reputation have been used on all of the hundred or more beautiful houses shown in this book, and how satisfactory the stains have proven, is set forth in some splendid testimonials by architects and owners. Among the Pacific Coast residences illustrated is the John D Spreck-

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els house at Coronado, Harrison Albright, architect, a two story house in Seattle, designed by Architects Bebb and Mendell, and a picturesque bungalow in Southern California by Architect Elmer Grey. Cabot's waterproof cement and shingle stains were used with fine results on all of these houses. The Book of 100 Homes is sent free to intending builders or architects. Cabot stains are sold in San Francisco by Waterhouse & Price.

Koa Wood for Cabinet Work

Following is an extract from the issue of the Harwood Record of August 10th, 1913:

"Koa, which is now shipped into this country under the name of Hawaiian mahogany, was the ancient royal and sacred wood of the islands. The chiefs were buried in coffins made of the wood of this tree. Forest Service bulletin 48 states that 'Koa is the only fairly abundant tree of the Hawaiian forests which is valuable because of its timber. It is a highly prized cabinet wood, which has been largely used on the islands and has also been exported in limited quantities. Its color varies through many rich shades of red and brown; its grain is fine and indistinct. Curly koa is especially prized, but is very rare. Most of the koa on Maui has been cut, but an extensive mature forest exists in Hilo and Puna at elevations of from 4,000 to 6,000 feet. This forest is but little known, but seems to contain some magnificent timber and to be in a good state of reproduction. Practically all of the forest is upon accessible government land, and could be utilized to great advantage should the government build a road to it and establish a sawmill for working up the mature trees.'"

A Hospital With Glass Rooms

A new problem in the design of heating and ventilating equipment will be presented when Chicago's new $300,000 isolation hospital is constructed. Among the novel features of this building will be glass hospital rooms, equipped with telephones, permitting persons recovering from contagious diseases to be visited by relatives and friends. The patients, rich and poor alike, instead of being herded in wards, as is now done, are to have separate rooms, each room or cubicle to be enclosed with glass.

The hospital is to be in the Twelfth ward, on a 27-acre site at Marshall boulevard and Thirty-first street, if the city is able to get title to the land. The

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ward buildings, all to be four stories high, are to be grouped in circular shape, facing Marshall boulevard, with the administration building in the center.

In the ward buildings, corridors eight feet wide in the center of each floor, are to form the means of visiting and conversing with patients. Each glass room adjoins this corridor. Outside of each room is to be a telephone instrument, protected from infection, connected with an instrument in the patient's room.

The plans have been drawn by City Architect Charles W. Kallal.

Government to Sell Lumber and Poles in Washington

A sale of government timber involving 70,450,000 board feet and 286,000 linear feet of cedar poles on the Olympic national forest, Washington, is about to be advertised.

Though all the timber will be sold to one bidder, it lies in two blocks, separated by an old burn, the result of a fire which consumed the timber on the intervening land. The first block is within the watershed of Little River, and is estimated to contain 16,060,000 board feet of Douglas fir, 1,780,000 feet of red cedar, 2,160,000 feet of western hemlock and 100,000 linear feet of cedar poles. The minimum rates which will be accepted for this timber are $1.65 a thousand for Douglas fir, $2 a thousand for red cedar, and 50 cents for western hemlock. The cedar poles will be sold for not less than three-fourths cents a linear foot for poles under 45 feet in length, with not greater than a 10-inch top diameter; 1¼ cents a linear foot for red cedar poles 45 feet and over in length, with not greater than a 10-inch top diameter.

On the second block, which is in the watershed of Ennis and Lake creeks, there are estimated to be 31,400,000 board feet of Douglas fir, 5,430,000 feet of red cedar, 13,400,000 of hemlock, 220,000 of amabilis fir, and 186,000 linear feet of red cedar poles. The prices here are a little higher than on the other block, and the minimum rates at which the timber will be advertised are: Douglas fir, $1.80 a thousand; red cedar, $2.50 a thousand; hemlock and amabilis fir, 50 cents a thousand. The rates for cedar poles are similar to those prescribed for the first block.

A period of five years will be allowed for the cutting and removal of the timber, subject to a readjustment in stumpage prices at the discretion of the forester in 1916.

Moral—Employ an Architect

From The Builders' Guide of Philadelphia

An interesting experiment is being tried in San Francisco—involving an attempt to save a four-story reinforced concrete building, which threatens to collapse because the builder neglected to provide it with suitable foundations. It appears that the owner selected, to build the structure for him, one of those contractors who makes it a business to act as his own architect. This person—working without plans and along the hit-or-miss lines followed by small contractors of that class—put in foundations which ran down but a few feet below the sidewalk level, and with footings such as are usually laid for the ordinary three-story frame dwelling.

At a depth of five or six feet under the building the earth is "blue mud," such as is found in marshes about the bay. The builder, however, did not drive piles, nor even lay concrete connecting girders for the foundation, and the structure has from the beginning been slowly settling down on its west side, with the settlement most marked at the northwest corner. The walls lean over more than two feet at the top, and they are cracked badly in many places.

The contractor first called in to save the building placed large timbers against the west wall, screwed these up tight, and then attempted to put in massive concrete piers, which sank about as

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rapidly as they were installed. The second, a practical structural engineer, has adopted a plan as novel as it is original.

"The latter made exhaustive tests of the concrete, soil and other elements in the problem. The concrete was found to be of a good class, which the engineers say saved the building from collapse. The mud underneath was found to be the bed of a slough under about half the building.

As a result of the examinations made, the engineers decided to cut off the building under the second story and put the upper part on a level base. The next move approved is to shift the building into the lot on the west side, after which the first story and foundations are to be removed. Then 142 piles will be driven, new foundations set and the piers and walls to the second story built anew, and when the concrete has set sufficiently the upper three floors will be moved back where they were before. The contract for this work, recently recorded, is for "moving a four-story concrete building to the lot adjoining and installing pile foundations and then returning the building.

The weight of the upper portion to be removed is estimated at 1,650 tons, which figure does not include the first story and foundations.

The owner will probably realize by the time the work is completed the utter fallaciousness of the idea of saving money by dispensing with the services of an architect. Here's a four-story business structure that has been idle for months, in momentary danger of collapse, the source of almost continuous worry and annoyance, and now the subject of an expense equal nearly to its original cost just because the owner was too ignorant to grasp at the outset the folly of permitting his builder to usurp the place of a man schooled in calculating loads and stresses. A few such experiences should serve to convince even the most hidebound that the ancient theory that every contractor is "able to do his own planning" is not based upon an intelligent understanding of the facts.

A Wonderful Building Record

The total building contracts entered into at San Francisco since the fire amounted to $239,224,801. All buildings erected within two years after the fire cost from 25 to 30 per cent more than the original recorded contract price, since then they have cost at least 10 to 15 per cent more than the original recorded contract price. It is, therefore, conservatively estimated that the total expended for building operations in San Francisco since the fire is not less than $294,500,000. There have been 46,529 building permits granted since the fire, for a total of $229,370,219.

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117 New York Building Over Sixteen Stories

Superintendent Rudolph P. Miller of the Bureau of Buildings has prepared a list of the tall buildings on Manhattan island, and it may surprise many persons to learn that there are only 1,156 structures of ten stories and over. Of those over sixteen stories there are but 117 buildings. Above the thirteen stories there are but 44 fourteen-story buildings, and only 20 sixteen-story ones, while there are no less than 389 in the thirteen-story class. The list by stories is:

Stories.	Buildings.
10	179
11	181
12	191
13	389
14	44
15	27
16	28
17	31
18	31
18	13
19	13
20	12
20	12
21	15
22	11
23	3
24	4
26	4
27	2
31	1
32	1
33	3
38	1
41	1
45	1
55	1
Total	1,156

This includes all buildings irrespective of occupation and those rated as semi-fireproof.

A Busy Oakland Roofing Contractor

It is not generally known that J. R. D. Mackenzie of the Mackenzie Roofing Company of Oakland was one of the first to introduce in this section the so-called felt and white marble roofing for residence and bungalow work. For a long time there was a demand for the white roofing and while asbestos has been used to some extent it has not proved entirely satisfactory, and the felt and white marble has worked out much more satisfactorily. Where the white effect is not desired a crushed brick is used and when this is made of vitrified brick it will stand exposure quite as well as the marble.

In the general roofing line, Mr. Mackenzie has completed a number of large contracts, among them the Doe Library at the State University in Berkeley, the work here consisting of a felt and gravel and clay tile roof. At Lodi a roofing contract has just been completed on the high school building designed by Architects Stone & Wright. This work included both slate and gravel roofing, the contract amounting to something like $4,000.

Other contracts that have been completed are the Syndicate Building, Woodmen of the World Building in Oakland, two schools in Richmond and one at Corning. At the present time Mr. Mackenzie is roofing the King Estate Building on Twelfth street, the Dalziel Building and the Hessman & Hoffman Building, all in Oakland. A contract has been signed for roofing the twelve-story First Trust & Savings Bank Building in Oakland from plans by Architect L. B. Dutton. Mr. Mackenzie will also do the roofing of the group of buildings now under construction at Livermore for the Coast Manufacturing & Supply Company.

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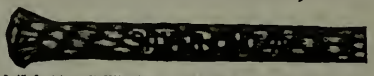

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Berkeley's New Federal Building

(From the Berkeley Gazette)

The first really authentic information concerning the new Berkeley postoffice, which is soon to be erected at Allston way and Milvia street, has reached this city in the form of a letter to Congressman Joseph R. Knowland, from Sherman Allen, Assistant Secretary of the United States Treasury Department. The letters were received by Postmaster Merrill and by Secretary Wells Drury of the Chamber of Commerce.

The site of the new building is centrally located, being between the Hotel Shattuck and the Polytechnic High School building, and opposite the new Y. M. C. A. building. The cost of the building will be $150,000, the sum of $30,000 having been paid for the land on which it will be erected.

The working drawings have been taken up by the architects and the structure will be most attractive. Plans are now being prepared and will undoubtedly be submitted before many weeks.

The following letter has been sent to Congressman Knowland by the Treasury Department of the United States:

"In connection with the proposed new postoffice building to be erected at Berkeley, California, I have the honor to advise you that the working drawings are being taken up. The proposals to be obtained will be based on the following materials and construction

"Exterior facing for walls will be of limestone or sandstone from grade to course above first floor level, stucco facing above, with marble loggia columns and terra cotta trimmings; the cornice to be of wood, with tile, tin and composition roofs. Except the roofs, the building will be of fireproof construction. The loggia will have marble tile floor, with terra cotta wainscoting and groined ceiling. The lobbies will have ceramic floor tile, marble wainscot and stucco ceiling beams; workroom to have cement wainscot with wood base and cap. Second story corridors are to have ceramic floor tile, marble base and wood wainscot; main stairs to have marble treads and risers, cast and wrought iron railing.

"Upon the basis of such data as this department has been able to collect through the postmaster or other local representatives of the government, it has been decided to place the principal front on Allston way, with side entrance on Milvia street."

In New Offices

The Pacific Sewer Pipe Company has moved its general offices to 825 East Seventh street, Los Angeles, where it has established a stock yard for handling the products of the company. The location is well chosen as the property has a frontage on Seventh street from Ruth avenue to Towne avenue.

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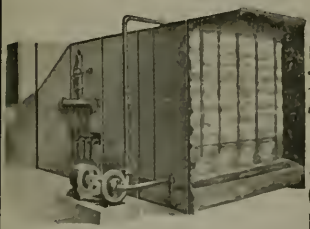

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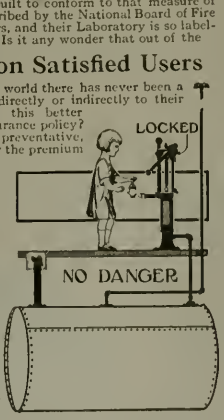

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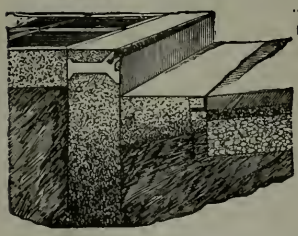

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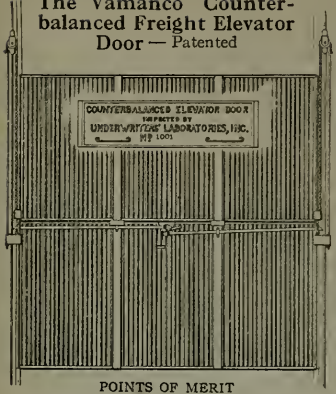

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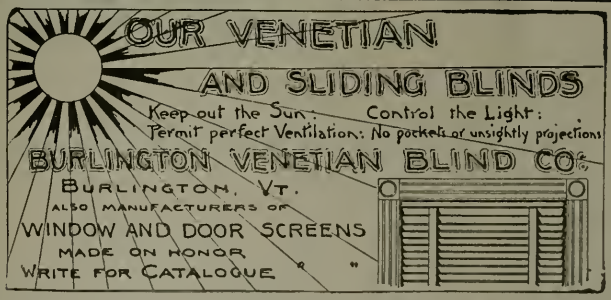

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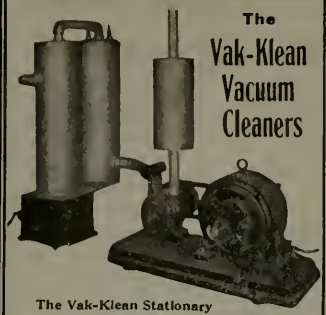

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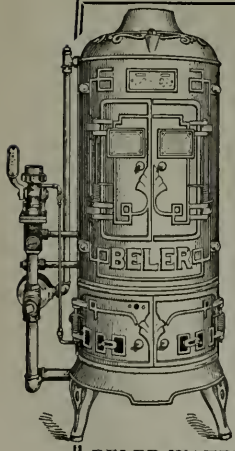

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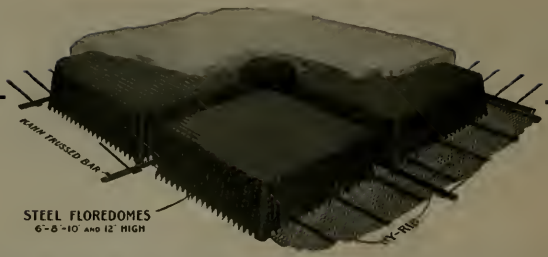

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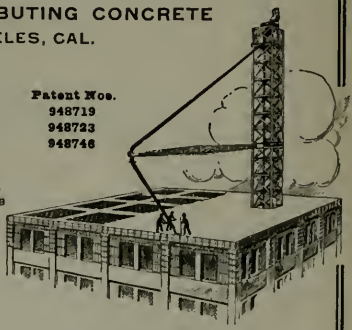

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6. Expensive Scaffolding, Runways and Staging
7. Tamping

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5. No Loss of Floor Tile, Displacement of Steel or Spilling
6. Saves Scaffolding, Runways and Staging
7. No Tamping

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California State Building, Panama-Pacific Exposition, San Diego.
John S. Hawley, Jr. Building, Santa Barbara.
G. M. Jones Hotel, Ocean Park.

BUILDINGS COMPLETED BY MEANS OF THE GRAVITY SYSTEM:

Ferguson Building, Los Angeles; Columbia Hospital Building, Los Angeles; Exposition Building for the State Agricultural Park, Los Angeles; Sweetwater Dam, San Diego, Cal.; Edison Electric Co., Three Warehouses, Long Beach; Spreckels Theatre and Office Building, San Diego, Cal.; L. H. Sly Apartment House, California and Powell Streets; 21st Viaduct, Portland, Oregon (International Contract Co., Contractors); South Pasadena Bridge, Los Angeles, Cal. (T. H. Haward, Contractor); Three Acres Car Barns for Los Angeles Railway Co. (E. J. Kubach, Contractor); Mary Andrews Clark Memorial Building, Los Angeles, Cal. (G. H. Whyte, Contractor). The Garland Theatre and Office Building, Los Angeles, Cal. (National Fireproofing Company, Contractors); Tempe Bridge, Phoenix, Arizona.

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Detroit, U.S.A. May 13, 1911

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Ohio

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AIR CLEANERS
"Tuec" air cleaners, manufactured by United Electric Co.....523 Mission St., S. F.

AIR COOLERS
California Air Purifying Co., 17th St., bet. Mission and Valencia, S. F.
Kauffman Heating & Engineering Co., 2317 Olive St., St. Louis; Sherman Kimball, Inc., San Francisco agents.

ARCHITECTURAL MODELING
O. S. Sarsi.....123 Oak St., S. F.
Florentine Art Studio..932 Vallejo St., S. F.

ARCHITECTURAL SCULPTORS
I. P. Lipp Co.....153 Seventh St., S. F.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.
N. Clark & Sons ....112 Natoma St., S. F.

ASBESTOS FLOORING
Carrelin Asbestos Flooring Co., 11 Fremont St., S. F.

AUTOMATIC SPRINKLERS
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.

BANK FIXTURES AND INTERIORS
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A. J. Forbes & Son...1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co....365 Market St., S. F.
T. H. Meek Co.....1157 Mission St., S. F.

BELTING, PACKING, ETC.
H. N. Cook Belting Co., 317-319 Howard St., S. F.
New York Belting & Packing Co., Ltd., 129 First St., S. F.

BLACKBOARDS
C. F. Weber & Co.....365 Market St., S. F.

BOILERS
F. Harvey Searight.....Shreve Bldg., S. F.

BOLTS
Union Hardware & Metal Co., ..Los Angeles

BONDS FOR CONTRACTORS
Fidelity and Deposit Company of Maryland, Mills Bldg., S. F.
Globe Indemnity Co., 508 California St., S. F.
Levensaler-Speir Corporation, Monadnock Building, S. F
Massachusetts Bonding and Insurance Company.....First National Bank Bldg., S. F.
Pacific Coast Casualty Co., 416 Montgomery St., S. F.

BLUE PRINTING
Kleffel & Esser Co., Second St., near Market, S. F

BRICK
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Gladding, McBean & Company, Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Fire Brick Co....Livermore, Cal.
N. Clark & Sons.....112 Natoma St., S. F.
Pratt Building Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.
United Materials Co., Balboa Bldg., S. F.
Vallejo Brick & Tile Co., 343 Sansome St., S. F.

BRICK AND CEMENT COATING
American Paint & Dry Color Co., 560 Fulton St., S. F.
Wadsworth Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)
Trus-Con Par-Seal, made by Trussed Concrete Steel Co., see adv. for Coast agencies.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

BRONZE AND BRASS WORK
Louis De Rome.....150 Main St., S. F.

BUILDERS' HARDWARE
Lockwood's Builders' Hardware, sold by Pacific Hardware & Steel Co., San Francisco, Los Angeles and Portland, Ore.
Russell & Erwin Mfg. Co., Commercial Bldg., S. F.
Vounegut Hardware Co., Indianapolis. (See adv. for Coast agencies.)

BUILDERS' SUPPLIES
C. Jorgensen.....856 Market St., S. F.
Waterhouse & Price San Francisco and Oakland
City Supply Co., Inc., Sixth and Channel Sts., S. F.
Burt E. Edwards, ..1025 Phelan Bldg., S. F.
Western Builders' Supply Co., 155 New Montgomery St., S. F.

BUILDING MATERIAL ....
C. F. Pratt Building Material Co., Hearst Bldg., S.F.

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Atlas Portland Cement Co., represented by United Materials Co.....Balboa Bldg., S. F.
American Keene Cement,
Levensaler-Speir Corporation, Distributors, 259 Monadnock Bldg., S. F
Building Material Co., The (Inc.) 583 Monadnock Bldg., S. F.
Standard Portland Cement Co., and Santa Cruz Portland Cement Co. Crocker Bldg., S. F.

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DIXON'S SILICA GRAPHITE PAINT
BEST FOR STEEL SURFACE PROTECTION
JOSEPH DIXON CRUCIBLE CO., Pac. Coast Branch 155 Second Street SAN FRANCISCO

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CEMENT—Continued
The Building Material Co., "Medusa White Portland" ....583 Monadnock Bldg., S. F.

CEMENT EXTERIOR WATERPROOF COATING
American Paint & Dry Color Co., 560 Fulton St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See distributing Agents on page 153.]
Petrifax Cement Coating, sold in San Francisco by Sherman Kimball, 503 Market St.
Biturine Co. of America, 24 California St., S. F.
Hercules Waterproofing, manufactured by Hercules Waterproofing Cement Co., Buffalo, N. Y. Distributors: Waterbouse & Price Co., San Francisco and Oakland.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT EXTERIOR FINISH
American Paint & Dry Color Co., 560 Fulton St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing agents on page 153.]
Concrewaltum Paint, manufactured by Goheen Company, Canton, O. Coast branches, San Francisco, Portland and Seattle.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing Agents on page 153.]
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
Muller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.

CEMENT GUN
Pacific Coast Gun Co..766 Folsom St. S. F

CEMENT TESTS AND CHEMICAL ENGINEERS
Robert W. Hunt & Co., 418 Montgomery St., S. F.

CHURCH INTERIORS
Fink & Schindler.....218 13th St., S. F.

COAL CHUTES
Majestic Furnace Company, Sherman Kimball & Co., Inc.....507 Mission St., S. F.

CLOCKS—TOWER AND STREET
E. Howard Clock Company.....New York
For Pacific Coast agents see advertisement.

COOLERS AND HUMIDIFYERS
California Air Purifying Co., Seventeenth St., S. F.

CLOTHES DRYERS
The Hill-Canton Dryer Company, Canton, O., represented by Sherman-Kimball & Co., Inc. .....S. F.
Neponset Waterdyke Felt and Compound manufactured by F. W. Bird & Son, East Walpole, Mass.; sold by Parrott & Co., 320 California St., S. F.

COMPOSITION FLOORING
Fibrestone & Roofing Co., 971 Howard St., S. F.
Lithoid Products Co., Merchants Exchange Bldg., S. F.

CONCRETE CONSTRUCTION
"Mushroom" System of Concrete Flat Slab
Bluxome & Co., Monadnock Bldg., S. F.
Clinton Fireproofing Company, Mutual Bank Bldg., S. F.
Construction Industrial Engineering Co., Clunie Bldg., S. F.
Foster, Vogt Co.....Sharon Bldg., S. F.
Petersen, H. L. .....62 Post St., S. F.
Ransome Concrete Company, Oakland and Sacramento
F. J. R. Rickon.....1859 Geary St., S. F.
F. J. Klenck.....Sbaron Bldg., S. F.

CONCRETE MIXERS
Austin Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., the Beebe Company, Portland and Seattle, and P. B. Engh, Los Angeles.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., S. F.
Ransome Mixers, sold by Norman B. Livermore & Co.... Metropolis Bank Bldg., S. F.
Smith Mixers sold by Parratt & Co., San Francisco, Los Angeles and Portland.
Marsh-Capron Mixers, sold by Langford, Bacon & Myers, Rialto Bldg., S. F.
Koehring Mixer, sold by Harron, Rickard & McCone, San Francisco.

CONCRETE PILES
Harron, Rickard & McCone, Townsend Street, San Francisco.
Portland Concrete Pile Co., 754 Phelan Bldg., S. F.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle
Clinton Welded Reinforcing System, L. A. Norris, Monadnock Bldg., S. F.

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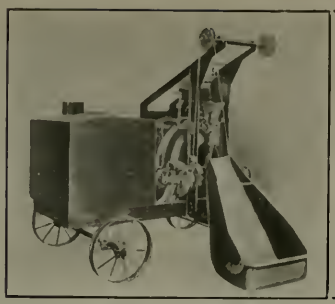

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SAN FRANCISCO — LOS ANGELES

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Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

CONCRETE BRICK AND TILE
Golden Gate Concrete Producta Co., Inc. 404 Rialto Bldg., S. F.

CONCRETE CHIMNEYS AND SILOS
Delta Construction Co., 302 Forum Bldg., Sacramento Cal.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Liquid Stone Paint Co., Hearst Bldg., S. F.
"Concreta," sold by W. P. Fuller & Co., S. F.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
Moller & Schumann...1023 Mission St., S. F.

CONTRACTOR'S EQUIPMENT
Burt E. Edwards,.....1025 Pbelan Bldg., S. F.
C. H. & E. Mfg. Co., Inc., Milwaukee, Wis., represented by Parrott & Co., S. F., Beebe Co., Portland, A. F. George, Los Angeles, E. P. Jamison, Seattle.

CONTRACTORS, GENERAL
Commary-Peterson Co., Inc., 46 Kearny St., S. F.
F. J. Klenek.....Sharon Bldg., S. F.
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Foster, Vogt Co.....Sharon Bldg., S. F.
Geo. W. Boxton.....Hearst Bldg., S. F.
Holm & Son.....Foxcroft Bldg., S. F.
McLaren & Peterson.....Sharon Bldg., S. F.
Northern Construction Co., Mills Bldg., S. F.
Higginson Co., Inc., 804 Humboldt Bank Bldg., S. F.
Graham & Jensen....185 Stevenson St., S. F.

CONTRACTORS, GENERAL—Continued
Ransome Concrete Co., 1218 Broad'y, Oakland
F. J. Rickon, C. E., 1859 Geary St., S. F.
Robert Trost....26th and Howard Sts., S. F.
Williams Bros. & Henderson, Holbrook Bldg., S. F.
Burt T. Owsley....311 Sharon Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal.
Ward & Goodwin.....Sharon Bldg., S. F.

CORK TILING
David J. E. Kennedy, Inc.Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., S. F.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Goheen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing, manufactured by Hercules Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Litboid Product Company, Merchants Exchange Bldg., S. F.
Trus-Con Damp proofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F.
Liquid Stone Paint Co....Hearst Bldg., S. F.

CALIFORNIA MARBLE

Seven Different Grades—Superior Finish—Moderate Price
Used in the New San Francisco Hall of Justice, Merchants Exchange Building Alaska Commercial Building, and others.

COLUMBIA MARBLE COMPANY
268 MARKET STREET, Rooms 201-202 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.
Richards-Wilcox Mfg. Co.....Aurora, Ill.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.
Spencer Elevator Company, 173 Beale St., S. F.
Excelsior Dumb Waiters, manufactured by R. M. Rodgers Co., Brooklyn; M. E. Hammond, 217 Humboldt Bank Bldg., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co...185 Stevenson St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., S. F.

ELEVATORS
Otis Elevator Company, Stockton and North Point, S. F.
Spencer Elevator Company, 126 Beale St., S. F.
Van Emon Elevator Company, Natoma St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., 593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
J. C. Hurley..... 12 Geary Street, S. F.
Hunter & Hudson.....Rialto Bldg., S. F.

EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices mfrd. by Vornegut Hardware Co. (see adv. for Coast Distributors).

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., 593 Market St., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vornegut Hardware Co. (see adv. for Coast Agencies).

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435. 370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago. (See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., Head Bldg., S. F.
Gladding, McBean & Company, Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., L. A.
The Jackson Fireproof Partition Co. Levensaler-Spier Corporation, Distributors, Monadnock Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Company, 1157 Mission St., S. F.

FLOOR VARNISH
Bass-Hueter and Sloane Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Moller & Schumann Co., 1022 Mission St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., S. F.

FORMS FOR CONCRETE
Metal form work, sold by California Sales & Supply Co.....San Diego

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co. .....612 Howard St., S. F.

GARBAGE CHUTES
Bill & Jacobsen.....524 Pine St., S. F.

GLASS AND GLAZING
W. P. Fuller & Co., San Francisco, Los Angeles and Portland.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Dodge & Lathrop.....Rialto Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
Niles Sand, Rock & Gravel Co., Mutual Bank Bldg., S. F.

HARDWALL PLASTER
American Keen Cement Co. Levensaler-Spier Corporation, Representatives, Monadnock Bldg., S. F.

WATER HEATERS - PUMPS
BOILERS

F. HARVEY SEARIGHT
SHREVE BLDG. SAN FRANCISCO

W. R. BRODE, Pres. R. J. BRODE, Secretary Telephone Kearny 2464

BRODE IRON WORKS

ESTABLISHED 1886 — INCORPORATED 1913

Manufacturers of Structural Steel and Ornamental Iron Work

Office and Works: 31-37 Hawthorne St., bet. Howard and Folsom Sts., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWARE
Pacific Hardware & Steel Co..S. F. and L. A.
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.

HARDWOOD FLOORING
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

HARDWOOD LUMBER
Parrott & Co.....320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co.,
First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater, sold by Thos. Thieben & Co. .....667 Mission St., S. F.

LOCKERS
Keyless Lock Co.....Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
Edward Stephenson..155 Fremont St., S. F.
C. A. Dunham Co., Marshalltown, Iowa,
Western Division Office,
Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co.,
Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F.
J. C. Hurley..... 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
17th St., bet. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOSE RACKS AND REELS
Levensaler-Spier Corporation,
259 Monadnock Bldg., S. F.

HOTELS
The Angelus, Loomis Bros.....Los Angeles

HOLLOW BLOCKS
Atlas Stone Co.....663 Mission St., S. F.

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.

INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
418 Montgomery St., S. F.

INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.

INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co.,
155 New Montgomery St., S. F.

LIME
Holmes Lime Company,
Monadnock Bldg., S. F.
Shasta Lime Products Company,
1550 Bryant St., S. F.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So.....Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (see adv. on page 38 for Coast representatives).

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co.,
Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co.,
Pacific Bldg., S. F.
Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors,
Monadnock Bldg., S. F.
John Roebling Sons Co., Folsom St., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
Pratt Building Material Co.,
Hearst Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc.,
Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metallic Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.
Canton Mfg. Co., Sherman-Kimball & Co.,
507 Mission St., S. F.

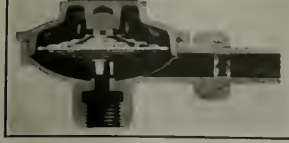
METAL FURNITURE
Dahlstrom Metallic Door Co., represented by M. G. West Co..353 Market St., S. F.
The Keyless Lock Co.....Indianapolis, Ind.
Van Dorn Iron Works Co.....Cleveland, O.
M. G. West Co.....353 Market St., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.....220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co..
275 Connecticut St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co.,
349 Seventh St., S. F.
I. G. Braun.....Chicago and New York
Ralston Iron Works,
20th and Indiana Sts., S. F.
Standard Iron Works,
235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc.,
19th and Minnesota Sts., S. F.



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Makes Good on Every Essential Point, Send for Catalog

Western Division Office

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SAN FRANCISCO PHONE SUTTER 2548

CONCRETE FLOORS MADE { WEAR-PROOF / DUST-PROOF / WATER-PROOF } at 2¼c Per Sq. Ft. with

May we tell you more about it?

ALLEN M. OLINGER, Dist.,
With WATERHOUSE & PRICE, SAN FRANCISCO, CAL.

METALCRETE

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE—Cont'd.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.

PAINT FOR BRIDGES
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Joseph Dixon Crucible Co., Coast branch, 155 Second St., S. F.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
American Paint & Dry Color Co., 560 Folsom St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Ad-el-ite paint, sold by Comyn-Mackall & Co., 310 California St., S. F.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors

PAINT SPECIALTIES
Comyn-Mackall & Co., 310 California St., S. F., agents for Ad-el-ite Paints.

PAINTS, OILS, ETC.
American Paint & Dry Color Co. 560 Fulton St., S. F.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
R. N. Nason Company.....San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Moller & Schumann Co., 1022 Mission St., S. F.
Berry Bros.....250 First St., S. F.
Paraffine Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.

PAVING BRICK
Vallejo Brick & Tile Co., 343 Sansome St., S. F.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRAPHY
R. J. Waters Co.....717 Market St., S. F.
Walter Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation.....259 Monadnock Bldg., S. F.
"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.
Herman Bosch.....4420 20th St., S. F.

PLUMBING
Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Coleman.....706 Ellis St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.....1001 Monadnock Bldg., S. F.
Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

POWER PLANT EQUIPMENT
F. Harvey Searight...817 Shreve Bldg, S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company.....San Francisco, Seattle, Portland and Los Angeles

RADIATORS
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.
Langford, Bacon & Myers, Rialto Bldg., S. F.

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton, Sts., S. F.

REVOLVING DOORS
American Revolving Door Co., 2514 Monroe St., Chicago, Ill.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F.

ROOFING AND ROOFING MATERIALS
Ames-Irwin Co., Inc., Eighth & Irwin Sts., S. F.
Biturine Co. of America, 24 California St., S. F.
F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co., Rialto Bldg., S. F.

W. F. AVERY, PROP. PHONE KEARNY 5319
STANDARD IRON WORKS
ORNAMENTAL IRON BRASS AND BRONZE
Store Fronts, Elevator Enclosures, Fire Escapes, Grille Work, etc.
OFFICE AND WORKS 235-237-239 SHIPLEY STREET SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ROOFING AND ROOFING MATERIALS—Continued

Grant Gravel Co.....Williams Bldg., S. F.
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy, Monadnock Bldg., S. F.
Fibrestone & Roofing Co., 971 Howard St., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
Mackenzie Roof Co., 425 15th St., Oakland.
United Materials Co.... Balboa Bldg., S. F.

ROOFING TIN

American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.

RUBBER TILING AND MATTING

New York Belting & Packing Co., 129 First St., S. F.

SAFETY TREADS

Universal Safety Tread Co., represented by Waterhouse and Price, San Francisco and Oakland.
Mason Safety Tread—See advertisement on page 123 for Coast agents.

SANDSTONE BRICK

Sacramento Sandstone Brick Co., Sacramento, Cal.

SANITARY DRINKING FOUNTAINS

N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.....Monadnock Bldg., S. F.

SASH CORD

Puritan Sash Cord Company. (For Coast Agents, see advertisement.
Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines 88 Broad St., Boston, Mass.
Silver Lake A Sash Cord, represented by Sanford Plummer, 149 New Montgomery St., S. F.

SCENIC PAINTING—DROP CURTAINS, ETC.

The Edwin H. Flagg Scenic Company, 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES

C. F. Weber & Co....365 Market St., S. F. 512 S. Broadway, Los Angeles.

SHEATHING AND SOUND DEADENING

Neponset Waterproof Building Papers, Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK

Berger Mfg. Co.....1120 Mission St., S. F.
Capitol Sheet Metal Works, 1927 Market St., S. F.
Yager Sheet Metal Co.....Oakland, Cal.
Western Furnace & Cornice Co., 1645 Howard St., S. F.

SHINGLE STAINS

Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

SIDEWALK LIGHTS

J. A. Steedman,.....Phelan Bldg., S. F.

SKYLIGHT CORNICES, ETC.

Yager Sheet Metal Co.....Oakland, Cal.

SPIRAL CHUTE

The Haslett Spiral Chute Co., 310 California St., S. F

STEEL AND IRON—STRUCTURAL

Central Iron Works..621 Florida St., S. F.
Dyer Bros. ..... San Francisco
Judson Manufacturing Company, 819 Folsom Street, San Francisco.
Brode Iron Works,..31 Hawthorne St., S. F.
Mortenson Construction Co., 19th and Indiana Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, Agt., 135 Kearny St., S. F.
Pacific Rolling Mills, 17th and Mississippi Sts., S. F.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, Etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.
Ralston Iron Works, Twentieth and Indiana Sts., S. F.
Schrader Iron Works .....San Francisco
U. S. Steel Products Company, Rialto Bldg., S. F.
Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Western Iron Works....141 Beale St., S. F.
Woods & Huddart ...444 Market St., S. F.

STEEL BARS FOR CONCRETE REINFORCEMENT

Judson Manufacturing Company, 819 Folsom Street, San Francisco
Kahn and Rib Bars, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Woods & Huddart....444 Market St., S. F.

STEEL FURNITURE

The Keyless Lock Co.....Indianapolis, Ind.

STEEL MOULDINGS FOR STORE FRONTS

J. G. Braun, 537 W. 35th St., N. Y., and 615 S. Paulina St., Chicago.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK - President
ORNAMENTAL IRON & BRONZE WORK
349 - 365 SEVENTH ST. SAN FRANCISCO.
TELEPHONE: MARKET 2162

Turner Mushroom System

of Concrete Construction for Buildings and Bridges

The original reinforced concrete flat slab. No beams or girders.
Permits of a very rapid erection.
Effects a great saving in form cost and labor.
Vibration reduced to a minimum.
Makes possible accurate computation of deflection and strength.
Successfully used in more than 1000 important structures.
A system that assures economy and rapidity of construction together with durability and low maintenance.

C. A. P. TURNER
Phoenix Bldg., MINNEAPOLIS, MINN.

Pacific Coast Representatives
INDUSTRIAL ENGINEERING CO.
Clunie Building, San Francisco
E. T. FLAHERTY,
I. W. Hellman Building, Los Angeles
A. P. HUECKEL,
Vancouver Building, Vancouver, B. C.

C. S. HOFFMAN L. W. FLEIGNER
GOLDEN GATE STRUCTURAL and ORNAMENTAL IRON WORKS
Structural Works, 107-109 Eleventh Street
Ornamental Iron, Wire Works and Office, 1479 Mission Street, San Francisco
WE CARRY A FULL STOCK OF STRUCTURAL MATERIALS
Pacific Telephone, Market 5445 Home Phone J1815

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL FIREPROOF WINDOWS
Canton Mfg. Co., represented by Sherman-Kimball & Co.....507 Mission St., S. F.

STEEL STUDDING
Collins Steel Partition, Parrott & Co., S. F.
"Lesco," Metal Stud, Levensaler-Speir, Corporation,.....Monadnock Bldg., S. F.

STONE
Parry Stone Co., "Sanpeta," "Colete," and "Manti" white stone, 417 Montgomery St., S. F.

STONE MANTELS
Atlas Stone Company, Inc., 663 Mission St., S. F.

STORAGE SYSTEMS
S. F. Bowser & Co., 612 Howard St., S. F.

STORE FRONTS
Kawneer System, Kawneer Manufacturing Company, 420-422 Turk St., S. F.; branches in Portland, Spokane, Seattle and Los Angeles.

SURETY BONDS
Globe Indemnity Co., 508 California St., S. F.
Mass. Bonding & Insurance Co., First Nat'l Bk. Bldg., S. F.
Fidelity & Deposit Co. of Maryland, Mills Bldg., S. F.

TERRA COTTA CHIMNEY PIPE
Gladding-McBean Co....Crocker Bldg., S. F.

TILES, MOSAICS, MANTELS, ETC.
Mangrum & Otter....561 Mission St., S. F.
Watson Mantel & Tile Co., Sbeldon Bldg., S. F.
John Petrovffsky.....523 Valencia St., S. F.

TILE FOR ROOFING
Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
Gladding, McBean & Company, Crocker Bldg., S. F.
United Materials Co.....Balboa Bldg., S. F.

TIN PLATES
American Tin Plate Company, Rialto Bldg., S. F.

VACUUM CLEANERS
Bill & Jacobsen.....524 Pine St., S. F.
The Vak-Klean Vacuum Cleaner, Pneulectric Co., Pacific Coast Agts., 452 Larkin St., S. F.
Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., S. F., and 3d and Jefferson Sts., Oakland.
"Tuec" Air Cleaner, manufactured by United Electric Co.....523 Mission St., S. F.

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Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

VALVES
Jenkins Bros.....247 Mission St., S. F.

VALVE PACKING
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Moller & Schumann Co., Brooklyn, N. Y., Chicago and S. F.
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Pacific Spring Bed Co., Bankers' Investment Bldg., S. F.

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Levensaler-Spier Corporation, Monadnock Bldg., S. F.
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Beler Water Heater Co., 1758 Broadway, Oakland

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Concrewaltum, made by Gobeen Mfg. Co., Canton, O. See advertisement for Coast distributors.
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Hercules Waterproofing Cement Co., represented by Waterhouse & Price, San Francisco and Oakland.
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Neponset Waterdyke Felt and Compound, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co. .....Rialto Bldg., S. F.
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If you have only seen the crude and tawdry colors of the thinned-paint imitations of

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you have no idea of the beautiful coloring effects of the true Stains. They are soft and deep, like velvet, but transparent, bringing out the beauty of the wood grain. Half as expensive as paint, twice as handsome, and the only Stains made of Creosote, "the best wood preservative known."

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40 Times Warmer than Common Papers

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Cabot's Waterproof Cement Stains. Waterproof Brick Stains. Conservo Wood Preservative. Damp-proofing, Waterproofing, Protective Paint, etc.

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Copper Bearing Roofing Tin is stamped "C. B. Open Hearth" in addition to the brand. Look for it. We also manufacture Apollo Best Bloom Galvanized Sheets, Black Sheets, Special Sheets, Corrugated Sheets, Formed Roofing and Siding Products, Etc.

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All kinds of wood and fabrics absolutely and permanently *Flameproofed* at small expense

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An increase of a small fraction of one per cent. in the Carbon, Manganese, Copper, Sulphur, Phosphorous and Silicon in iron and steel which is to be exposed to weather conditions will soon send it to the scrap heap.

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Sanitary—Damp-Proof—Lasting.

MANUFACTURED BY AMERICAN PAINT AND DRY COLOR COMPANY

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Works at Davenport, Cal. Capacity, 10,000 Barrels Daily

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¶Meets the discriminating demand for a finish with a firm, hard surface that will not crack, crumble nor rub off like a kalsomine wash invariably does. It is furnished in serviceable and satisfying shades. Color Cards on application and also a list of buildings on which this decorative specialty has been used.

Western Made for Western Trade

FULLER'S
Washable Wall Finish

READY FOR USE

Attractive
Sanitary
Washable

Manufactured by

W. P. FULLER & CO.

All Principal Coast Cities

"HERCULES"

Produces an absolutely impermeable concrete for Foundations, Floors, Reservoirs, Cold Storage Rooms, Dams, Sewers, etc. Also for Stucco, Plaster Coat Work and Porous Brick.

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PASTE } **FORMS**
LIQUID

"Hercules" POWDER or PASTE form of Waterproofing should be used throughout in the aggregate of all new concrete work, and in Cement Plaster Coating for old work.

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USE PLASTERGON
Instead of LATH and PLASTER
It's more economical, durable and sanitary
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FACED WITH 60,000
Red Stock Brick
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INCORPORATED JANUARY 11, 1889

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COMMERCIAL MINERALS FOR BUILDING PURPOSES

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The principal claims for the "CLIP BAR" Galvanized Curb Guard and Concrete Reinforcement are:

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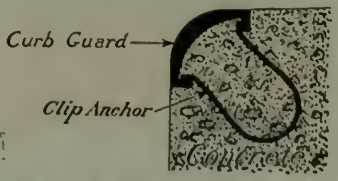
3.—Efficiency of service.
4.—Greater wearing surface than any other curb guard.
5.—Positive reinforcement of the concrete.
6.—Ornate appearance.
7.—Not affected by frost.
8.—Stronger and cheaper than granite.
9.—Not affected by expansion and contraction, as the guard is of practically uniform thickness throughout and therefore expands and contracts uniformly with the concrete in which it is imbedded.



We also handle the "T-HEAD" Curb Guard which is used under San Francisco, Oakland and Berkeley, City Engineers specifications.

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Special shapes and sizes made to order.
Standard sizes carried in stock.

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Manufactured by

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VITRIFIED SEWER PIPE

"A vitrified salt-glazed sewer pipe, burned to the point of vitrification, has been proved beyond all question to be proof against any destroying agent whatever, except fire, and is used in all conservative practice of able sanitary engineers throughout the United States."

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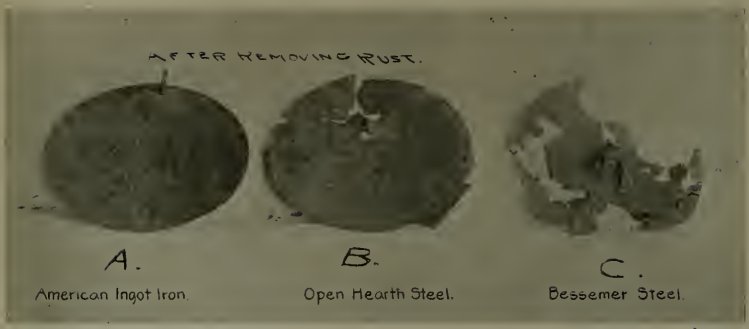

HERE is a photograph of results of what might be termed an Accelerated Exposure Test. Thin saucers made of American Ingot Iron, Open Hearth Steel and Bessemer Steel were all filled with cinders and set out doors for several months, at the end of which time they were found in the condition indicated.

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American Ingot Iron Roofing, Siding, Sheets, Plates, Pipe, Gutter and Terne Plate

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Use Discrimination in the Selection of Door Hangers

FOR your own sake, for the sake of those for whom you plan or build, inspect the No. 221 R-W House Door Hanger. Take time and examine *every part.* Notice the high quality of material and workmanship employed in its construction. See how the simple, effective adjustments provide for settling and sagging. Be particular to notice how easily and noiselessly this hanger glides over the clincher type hard maple track. Observe, too, that this strongly constructed track can be quickly and easily removed *after* plastering without disturbing or injuring the walls.

Your regular hardware dealer no doubt handles this hanger, but if not, we'll send you samples. If you haven't already got it, you ought to have our No. 10 Catalogue.

Richards-Wilcox
MANUFACTURING CO.
AURORA, ILL. U.S.A.
Two Hundred and Fifty Third Street

A Substitute for Tiling in Bath Rooms and Kitchens

Cover Plastered Surface and Wood Floors with Burlap or Canvas, Glued on, then Paint with two or three coats of

LIQUID STONE

Write for Specification Card covering this Class of Work to the following in Your Territory:

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THE LIQUID-STONE PAINT CO., Mfrs., San Francisco, Cal.

This is What We Mean by "Rigidity"

in "COLLINS" Interlocking Steel Studding and Furring

Plasterers will tell you they need no wood bracing to work on either single or double studding —if it is "COLLINS."

"COLLINS" Hollow Double Studding (Interlocking Steel System) is Cheaper—is 60% lighter —is speedier to erect than hollow tile, and its fireproof quality for insurance rate is the same.

WE CAN SHOW YOU THE JOBS

Collins Steel Studding and Furring

INTERLOCKING SYSTEM

PARROTT & CO.

320 California Street San Francisco

RESIDENCE, H. NELSON FLANAGAN
ENGLEWOOD, NEW JERSEY

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JOHN M. WHRITNER
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Homes of Distinction

are usually finished with Atlas-White stucco. It makes an effective appearance *and* is durable.

¶ Whether your client is building to sell, or to line in, makes no difference. He wants to get the most for his money. There's always, in every industry, one product that gives a full measure of satisfaction.

¶ Atlas-White makes a beautiful white stucco, and it is durable because it's a Portland of the highest grade.

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Productive capacity over 30,000 barrels per day
Largest in the World
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PORTLAND
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The PROMETHEUS

ELECTRIC
FOOD AND PLATE
WARMER

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No need to curtail Visit, Drive, or Entertainment

This faithful servitor takes care of belated luncheon, after theatre "bite," or formal dinner. Domestic freedom comes with it.

Call for demonstration or write

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Phone Douglas 319

WHAT IS MORE TROUBLESOME THAN TO PACK RADIATOR VALVES

YOU never seem to have the right size packing. Because there is no active rod travel through the stuffing box the packing sets and gets hard, and the valves leak more or less when open or closed.

Palmetto Twist

can be unstranded and any size valve packed from one spool.

It cannot burn — its all asbestos. Does not get hard — because a Perfect lubricant is forced into each strand.

Use **PALMETTO TWIST** on ALL the valves, and you will not have to repack so often.

We will send you a sample spool FREE. Just to prove this.

H. N. COOK BELTING CO.

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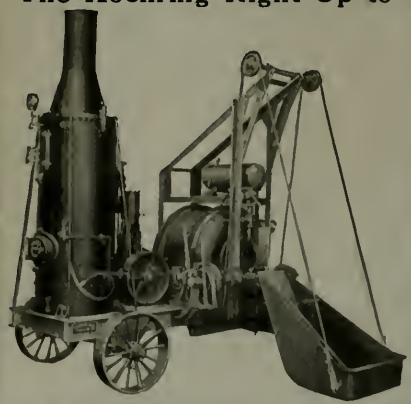

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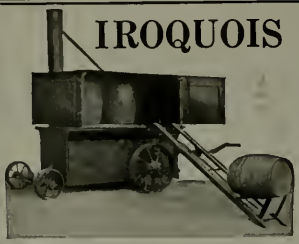

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THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XXXIV. OCTOBER, 1913. No. 3

Study for a Preparatory School

Modern Architecture

By THOMAS HASTINGS, Architect.

A notable contribution to the architectural literature of the day has been made by Mr. Thomas Hastings, of the well-known firm of Carrere & Hastings, of New York, before the Royal Institute of British Architects, Mr. Hastings having made the trip to Europe for the purpose of reading his paper before that distinguished body, in person. It is a carefully prepared exposition of the principles of true architectural composition.

WE American architects are ofttimes confronted with the question as to why we have not an architecture of our own, one which is essentially American; and why it is that so many of us who have studied in Paris seem inclined to inculcate the principles of the Ecole des Beaux-Arts into our American architecture. The majority of people do not seem to realize that in solving problems of modern life the essential is not so much to be National or American as it is to be modern and of our own period.

The question of supreme interest is: What influence life in its different phases has upon the development of architectural style. Style in architecture is that method of expression in the art which has varied in different periods, almost simultaneously throughout the civilized world, without reference to the different countries, beyond slight differences of national character mostly influenced by climate and temperament. Surely modern architecture should not be the deplorable creation of the would-be

The Los Angeles Music College *Arthur R. Kelly, Architect*

style-inventor, or that of the illogical architect living in one age and choosing a style from another.

Each Age has Its Own Style

The important and indisputable fact is not generally realized that from prehistoric times until now each age has built in one, and only one, style. Since the mound-builders and cave-dwellers, no people, until modern times, ever attempted to adapt a style of a past epoch to the solution of a modern problem; in such attempts is the root of all modern evils. In each successive style there has always been a distinctive spirit of contemporaneous life from which its root drew nourishment. But in our time, contrary to all historic precedents, there is a confusing selection from the past of every variety of style. Why should we not be modern and have one characteristic style expressing the spirit of our own life? History and the law of development alike demand that we build as we live.

One might consider the history and development of costumes to illustrate the principle involved. In our dress today we are modern but sufficiently related to the past, which we realize when we look upon the portraits of our ancestors of only a generation ago. We should not think of dressing as they did, or wearing a Gothic robe or a Roman toga; but as individual as we might wish to be, we should still be inclined, with good taste, to dress according to the dictates of the day.

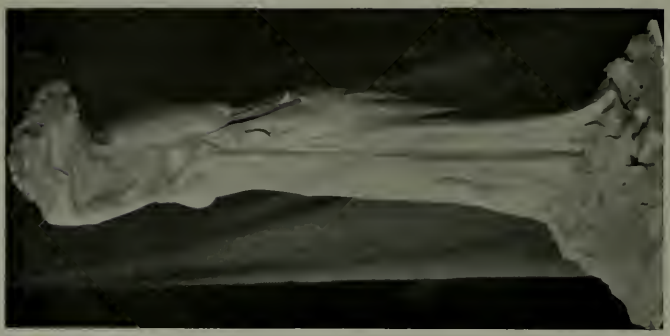
The irrational idiosyncrasy of modern times is the assumption that each kind of problem demands a particular style of architecture. Through prejudice, this assumption has become so fixed that it is common to assume that, if building a church or a university, we must make it Gothic; if a theatre, we must make it Renaissance. One man wants an Elizabethan house; another wants his house early Italian. With this state of things it would seem as though the serious study of character were no longer necessary. Expression in architecture, forsooth, is only a question of selecting the right style. The two parties with which we must contend are, on the one hand, those who would break with the past, and, on the other, those who would select from the past according to their own fancy.

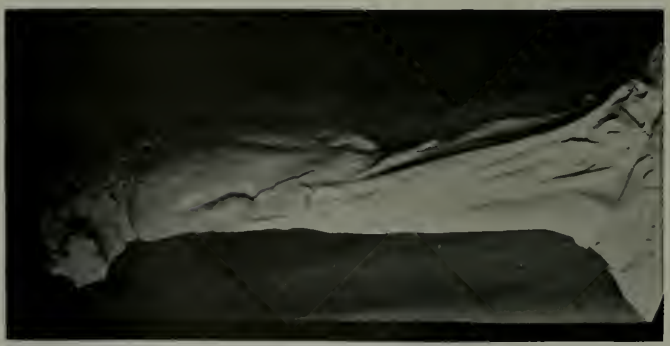
Style in its growth has always been governed by the universal and eternal law of development. This continuity in history of architecture is universal. The laws of natural selection and of the survival of the fittest have shaped the history of architectural style just as truly as they have the different successive forms of life. Hence, the necessity that we keep and cultivate the historic spirit, and that we respect our historic position and relations, and that we more and more realize in our designs the fresh demand of our time, more important even than the demands of our environment.

No Determining Change

What determining change have we had in the spirit and methods of life since the revival of learning and the Reformation to justify us in abandoning the Renaissance or in reviving Medieval art, Romanesque, Gothic, Byzantine, or any other style? Only the most radical changes in the history of civilization, such as, for example, the dawn of the Christian era and of the Reformation, and the revival of learning, have brought with them correspondingly radical changes in architectural style.

Were it necessary, we could trace two distinctly parallel lines, one the history of civilization and the other the history of style in art. In each case we should find a gradual development, a quick succession of events, a revival, perhaps almost a revolution and a consequent reaction, always together like cause and effect, showing that architecture and life must correspond. In order to build a living architecture we must build as we live. Compare the Roman orders with the Greek and with previous work. When Rome was at its zenith in civilization, the life of the people demanded of the architect that he should not only build temples, theatres, and tombs, but baths, palaces, basilicas, triumphal arches, commemorative pillars, aqueducts and bridges. As each of these new problems came to the architect, it was simply a new demand from the new life of the people; a new work to be done. When the Roman architect was given such varied work to do, there was no reason for his casting aside all precedent. While original in conception, he was called upon to meet these exigencies only with modifications of the old forms. These modifications very gradually gave us Roman architecture. The Roman orders distinctly show themselves to be a growth from the Greek orders, but the variations were such as were necessary in order that the orders might be used with more freedom in a wider range of problems. These orders were to be brought in





A Fountain by A. Iannelli

contact with wall or arch, or to be superimposed upon one another, as in a Roman amphitheatre. The Roman recognition of the arch as a rational and beautiful form of construction, and the necessity for the more intricate and elaborate floor plan, were among the causes which developed the style of the Greeks into what is now recognized as Roman architecture.

We could multiply illustrations without limit. The battlements and machicolated cornices of the Romanesque; the thick walls and the small windows placed high above the floor, tell us of an age when every man's house was indeed his castle, his fortress, and his stronghold. The style was then an expression of that feverish and morbid aspiration peculiar to medieval life. The results are great, but they are the outcome of a disordered social status not like our own; and such a status could in no wise be satisfied with the simple classic forms of modern times, the architrave and the column.

Each Builder a Zealot

Compare a workman of today building a Gothic church, slavishly following his detail drawings, with a workman of the fourteenth century doing such detail work as was directed by the architect, but with as much interest, freedom and devotion in making a small capital as the architect had in the entire structure. Perhaps doing penance for his sins, he praises God with every chisel-stroke. His life interest is in that small capital; for him work is worship and his life is one continuous psalm of praise. The details of the capital, while beautiful, may be grotesque; but there is honest life in them. To imitate such a capital today, without that life, would be affectation. Now a Gothic church is built by laborers whose one interest is to increase their wages and diminish their working hours. The best Gothic work has been done, and cannot be repeated. When attempted, it will always lack that kind of medieval spirit of devotion which is the life of medieval architecture.

We might enumerate such illustrations indefinitely.

If one age looks at things differently from another age, it must express things differently. We are still living today in the period of the Renaissance. With the revival of learning, with the new conceptions of philosophy and religion, with the great discoveries and inventions, with the altered political systems, with the fall of the Eastern Empire, with the birth of modern science and literature, and with other manifold changes all over Europe, came the dawn of the modern world; and with this modern world there was evolved what we should now recognize as the modern architecture, the Renaissance which pervaded all the arts and which has since engrossed the thought and labor of the first masters in art. This Renaissance is a distinctive style in itself, with natural variations of character, has been evolving for almost four hundred years.

Reason for Renaissance

So great were the changes in thought and life during the Renaissance period that the forms of architecture which had prevailed for a thousand years were inadequate to the needs of the new civilization: to its demands

for greater refinement of thought, for larger truthfulness to nature, for less mystery in form of expression, and for greater convenience in practical living. Out of these necessities of the times the Renaissance style was evolved—taking about three generations to make the transitions—and around no other style have been accumulated such vast stores of knowledge under the lead of the great masters of Europe. Therefore, whatever we now build, whether church or dwelling, the law of historic development requires that it be Renaissance; and if we encourage the true principles of composition it will involuntarily be a modern Renaissance; and with a view to continuity we should take the eighteenth century as our starting point, because here practically ended the historic progression and entered the modern confusion.

Imagine the anchronism of trying to satisfy our comparatively realistic tastes with Gothic architectural sculpture or with painting made by modern artists! Never until the present generation have architects presumed to choose from the past any style in the hope to do as well as was done in the time to which that style belonged. In other times they would not even restore or add to an historic building in the style in which it was first conceived. It is interesting to notice how the architect was even able to complete a tower or add an arcade or extend a building following the general lines of the original composition without following its style, so that almost every historic building within its own walls tells the story of its long life. How much more interesting alike to the historian and artist are these results!

In every case where the medieval style has been attempted in modern times the result has shown a want of life and spirit, simply because it was an anchronism. The result has always been dull, lifeless and uninteresting. It is without sympathy with the present or a germ of hope for the future—only the skeleton of what once was. We should study and develop the Renaissance and adapt it to our modern conditions and wants so that future generations can see that it has truly interpreted our life. We can interest those who come after us only as we thus accept our true historic position and develop what has come to us. We must accept and respect the traditions of our fathers and grandfathers and be, as it were, apprenticed by their influence. Without this we shall be only copyists, or be making poor adaptations of what was never really ours.

How Style is Developed

The time must come, and I believe in the near future, when architects of necessity will be educated in one style, and that will be the style of their own time. They will be so familiar with what will have become a settled conviction, and so loyal to it, that the entire question of style, which at present seems to be determined by fashion, fancy or ignorance, will be kept subservient to the great principles of composition, which are now more or less smothered in the general confusion.

Whoever demands of an architect a style not in keeping with the spirit of his time is responsible for retarding the normal progress of the art. We must have a language if we would talk. If there be no common language for a people there can be no communication of ideas either archi-

A Concert Hall, Massachusetts Institute of Technology
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Elevation
Measured Drawings of Palazzo Municipale Di Brescia

Detail
E. A. Titcomb, Architect

tectural or literary. I am convinced that the multiplicity of printed books and periodicals written by literary critics and essayists who have not even been apprenticed, but are writing with authority about art, has, perhaps, been more instrumental than anything else in bringing about this modern confusion. I believe that we shall one day rejoice in the dawn of a modern Renaissance, and, as always has been the case, we shall be guided by the fundamental principles of the classics. It will be a modern Renaissance, because it will be characterized by the conditions of modern life. It will be the work of the Renaissance architect solving new problems, adapting his art to an honest and natural treatment of new materials and conditions. Will he not also be unconsciously influenced by the twentieth century spirit of economy, and by the application of his art to all modern industries and speculations?

Only when we come to recognize our true historic position and the principles of continuity in history—when we allow the spirit of our life to be the spirit of our style, recognizing first of all that form and all design are the natural and legitimate outcome of the nature or purpose of the object to be made—only then can we hope to find a real style everywhere asserting itself. Then we shall see the consistency of style which has existed in all times until the present generation; then shall we find it in every performance of man's ingenuity: in the work of the artist or the artisan, from the smallest and most insignificant jewel or book cover to the noblest monument of human invention or creation; from the most ordinary kitchen utensil to the richest and most costly furniture or decoration that adorns our dwellings.

Must Express Ourselves

We must all work and wait patiently for the day to come when we shall work in unison with our time. Our Renaissance must not be merely archeological, the literal following of certain periods of the style. To build a French Louis XII or Francis I or Louis XIV house, or to make an Italian cinquecento design, is indisputably not modern architecture. No architect until our times slavishly followed the characteristics of any particular period; but he used all that he could get from what preceded him, solving such new problems as were the imperatives of his position.

What did a man like Pierre Lescot, the architect of the Henry II Court of the Louvre, endeavor to do? It would have been impossible for him actually to define the style of his own period. That is for us, his successors, to do. For him the question was how to meet the new demands of contemporaneous life. He studied all that he could find in Classic and Renaissance precedents applicable to his problem. He composed, never copying, and always with that artistic sense and the sense of the fitness of things which were capable of realizing what would be harmonious in his work. In the same way all architects, at all times, contributed to a contemporaneous architecture, invariably with modifications to meet new conditions. This must be done with a scholarly appreciation of that harmonious result which comes only from a thorough education. So, with freedom of the imagination and unity of design, an architecture is secured expressive of its time.

Our Lack of Conscientiousness

How is it with us in modern times? Not only do many architects slavishly follow the character of some selected period, but they also deliberately take entire motives of composition from other times and other places to patch and apply them to our new conditions and new life. Every man's conscience must speak for itself as to whether such plagiarism is right; but while the moral aspect of this question has very little to do with art, yet intellectually such imitative work, though seemingly successful, positively stifles originality, imagination and every effort to advance in the right direction.

The way is now prepared for us to endeavor to indicate what are some of the principal causes of the modern confusion in style. With us Americans, an excessive anxiety to be original is one of the causes of no end of evil. The imagination should be kept under control by given principles. We must have ability to discern what is good among our own creations, and courage to reject what is bad. Originality is a spontaneous effort to do work in the simplest and most natural way. The conditions are never twice alike; each case is new. We must begin our study with the floor plan, and then interpret that floor plan in the elevation, using forms, details and sometimes motives, with natural variations and improvements on what has gone before. The true artist leaves his temperament and individuality to take care of themselves.

Some say that if this is all that we are doing, there is nothing new in art; but if we compose in the right way, there can be nothing that is not new. Surely you would not condemn nature for not being original because there is a certain similarity between the claw of a bird and the foot of a dog, or between the wing of a bird and the fin of a fish. The ensemble of each creature is the natural result of successive stages of life, with variations of the different parts according to the principles of evolution. There are countless structural correspondencies in the skeletons of organic life, but these show the wonderful unity of the universe; and yet, notwithstanding this unity, nature is flooded with an infinite variety of forms and species of life.

We must logically interpret the practical conditions before us, no matter what they are. No work to be done is ever so arbitrary in its practical demands but that the art is elastic and broad enough to give these demands thorough satisfaction in more than a score of different ways. If only the artist will accept such practical imperatives as are reasonable, if only he will welcome them, one and all, as friendly opportunities for loyal and honest expression in his architecture, he will find that these very conditions will do more than all else besides for his real progress and for the development of contemporaneous art in composition.

Early American Architects

The architects in the early history of America were distinctively modern and closely related in their work to their contemporaries in Europe. They seem not only to have inherited traditions, but to have religiously adhered to them. I believe that it is because of this that the genuine and naive character of their work, which was of its period, still has a charm for us which cannot be imitated. McComb, Bulfinch, Thornton, Latrobe, L'Enfant, Andrew Hamilton, Strickland and Walters were sufficiently

American and distinctly modern, working in the right direction, unquestionably influenced by the English architecture of Inigo Jones, Sir Christopher Wren, James Gibbs, Sir William Chambers. Upjohn and Renwick, men of talent, were misled, alas! by the confusion of their times, the beginning of this modern chaos, the so-called Victorian-Gothic period.

Gifted as Richardson was, and great as his personality was, his work is always distinguished, because of its excellent quality, from the so-called Romanesque of his followers. But I fear the good he did was largely undone because of the bad influence of his work upon his profession. Stumpy columns, squat arches, and rounded corners, without Richardson, form a disease from which we in America are only just recovering. McComb and Bulfinch would probably have frowned upon Hunt for attempting to graft the transitional Loire architecture of the fifteenth century upon American soil, and I believe all will agree that the principal good he accomplished was due to the great distinction of his art, and to the moral character of the man himself, rather than to the general influence and direction of his work.

Whether we agree with Charles F. McKim, or not, in wanting to revive in the nineteenth century the art of Bramante, San Gallo and Peruzzi, he had perhaps more of the true sense of beauty than any of his predecessors in American art. His work was always refined, personal and with a distinctly more classic tendency in his most recent buildings.

Architecture and Character

We have seen that the life of an epoch makes its impress upon its architecture. It is equally true that the architecture of a people helps to form and model its character. In this way it reacts upon it. If there is beauty in the plans of our cities, and in the buildings which form our public squares and highways, its good influence will make itself felt upon every passerby. Beauty in our buildings is an open book of involuntary education and refinement, and it uplifts and ennobles human character: it is a son and a sermon without words. It inculcates in a people a true sense of dignity, a sense of reverence and respect for tradition, and it makes an atmosphere in its environment which breeds the proper kind of contentment, that kind of contentment which stimulates ambition. If we would be modern, we must realize that beauty of design and line in construction builds well, and with greater economy and endurance than construction which is mere engineering. The qualitative side of construction should first be considered, then the quantitative side. The practical and the artistic are inseparable. There is beauty in nature because all nature is a practical problem well solved. The truly educated will never sacrifice the practical side of his problem. The great economic as well as architectural calamities have been performed by so-called practical men with an experience mostly bad and with no education.

It is, I believe, a law of the universe that forms of life which are fittest to survive—nay, the very universe itself—are beautiful in form and color. Natural selection is beautifully expressed, ugliness and deformity are synonymous; and so in the economy of life what would survive must be beautifully expressed.

When we think of what the past ages have done for us, should we not be more considerate of those that are yet to come. A great tide of historic information has constantly flowed through the channel of monuments

erected by successive civilizations, each age expressing its own life, and we can almost live in the past through its monuments.

The recently discovered buried cities of Assyria give us a vivid idea of a civilization lost to history. The Pyramid of Cheops and the Temples of Karnak and Luxor tell us more of that ingenuity which we cannot fathom, and the grandeur of the life and history of the Egyptian people, than the scattered and withered documents and fragments of inscriptions that have chanced to survive the crumbling influences of time. The Parthenon and the Erechtheum bespeak the intellectual refinement of the Greeks as much as their epic poems or their philosophy. The triumphal arches, the aqueducts, the Pantheon and the basilicas of Rome tell us more of the great constructive genius of the early republic and the empire of the Caesars than the fragmentary and contradictory annals of wars and political intrigues.

The unsurpassed and inspiring beauty of the Gothic cathedrals which bewilder us, and the cloisters which enchant us, impress on our minds a living picture of the feverish and morbid aspirations of medieval times—a civilization that must have mingled with its mysticism an intellectual and spiritual grandeur which the so-called Dark Ages of the historian have failed adequately to record; and in America, even amid the all-absorbing work of constructing a new government, our people found time to speak to us today in the silent language of their simple colonial architecture of the temperament and character of our forefathers.

Will our monuments of today adequately record the splendid achievements of our contemporaneous life—the spirit of modern justice and liberty, the progress of modern science, the genius of modern invention and discovery, the elevated character of our institutions? Will disorder and confusion in our modern architecture express the intelligence of this twentieth century? Would that we might learn a lesson from the past—that modern architecture, wherever undertaken, might more worthily tell the story of the dignity of this great epoch and be more expressive of this wonderful contemporaneous life.

* * *

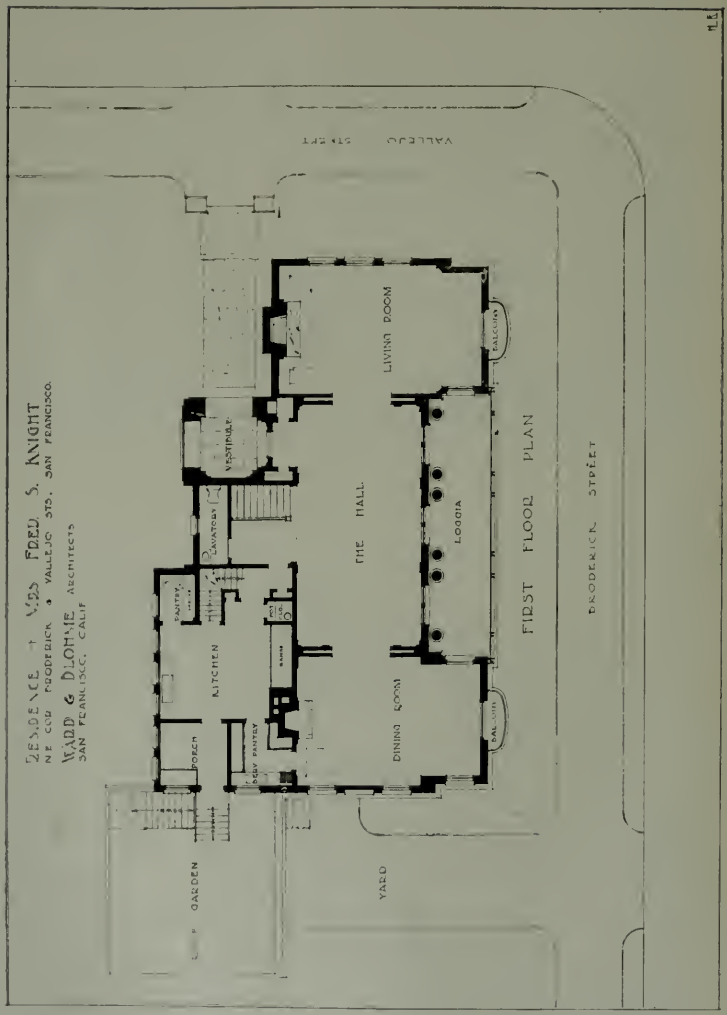
The City Residence of Mrs. Fred S. Knight

THE illustrations of the residence of Mrs. Fred S. Knight show a good example of the type of San Francisco residences which indicate the trend toward the designing of homes that combine comfort with simplicity of design and detail.

The architects, Messrs. Ward and Blohme, have selected a free adaptation of Italian motifs. The exterior is in cream plaster with a roof of flat red tile; this combined with soft green lattices and balustrades produces a charming effect. The main entrance is approached over a split stone flag pavement with moss in the interstices and joints. The living room is in silver gray enamel with carved gray marble mantel as the central feature. The main hall is in old ivory with French windows opening onto a tiled terrace which overlooks the bay and the Golden Gate. The dining room is in mahogany. The electric light fixtures, by Thomas Day Company, are especially well designed, consisting of an indirect system throughout, with alabaster globes and bowls, dull burnished gold carved effects and silk furnishings to match the tapestry wall coverings of the various rooms. The house is on a northeast corner and, nevertheless, is so planned that every room has a marine view.

Residence of Mrs. Fred S. Knight, San Francisco
Ward & Blohme, Architects

Residence of Mrs. Fred S. Knight, San Francisco
Ward & Blohme, Architects


RESIDENCE of MRS FRED S. KNIGHT
NE COR BRODERICK & VALLEJO STS. SAN FRANCISCO.
WARD & BLOHME ARCHITECTS
SAN FRANCISCO, CALIF
VALLEJO STREET
LIVING ROOM
BALCONY
VESTIBULE
LAVATORY
THE HALL
LOGGIA
FIRST FLOOR PLAN
BRODERICK STREET
PANTRY
KITCHEN
DINING ROOM
BALCONY
PORCH
BERY PANTRY
GARDEN
YARD

Detail of Facade, Residence of Mrs. Fred S. Knight, from Porch
Note Splendid View of the Golden Gate in Distance

Second Floor Plan, Residence of Mrs. Fred S. Knight, San Francisco

Interior Residence of Mrs. Fred S. Knight, San Francisco
Ward & Blohme, Architects

Dining Room, Residence of Mrs. Fred S. Knight, San Francisco
Ward & Blohme, Architects

Interior Residence of Mrs. Fred S. Knight, San Francisco
Ward & Blohme, Architects

Interior of Oval, View of North Loggia and Oval Across Beale and St. Frances Wood
Bluxome & Company, Builders

Brick House by Parcel Post

When the parcel post was first introduced, someone, as a joke, shipped a wagon load of brick to his friends in various parts of the country, each brick going as a separate shipment. While the wag who conceived the idea of making the postman shrivel under the unaccustomed load thought he had devised something unique, those in charge of a brick exposition in Chicago went him one better by having enough brick shipped in from all parts of the country by parcel post to enable an entire house to be constructed of them. So the transition to equally massive machinery parts was not a radical change.

It is in this connection, the supplying of parts for machinery, that the parcel post has made itself useful to members of the trade. So useful has the system become, in fact, that many machinery houses already regard it as well nigh indispensable. It is certain that it has unique advantages which could not be duplicated in any other way, and that those who are using it are inclined to increase rather than lessen their application of the idea.

The use of the postoffice service for shipping parts is declared to result both in economy and expedition. When express service is used, as it was exclusively until the arrival of the new service this year, there is a certain amount of delay in draying the goods from the factory to the express office and then in getting them from the station to the user. This was particularly true of small towns, where the express companies made little or no provision for deliveries.—American Machinist.

* * *

Wanted — Work

The following verses appeared in a recent number of Collier's. They were written by Berton Braley, the official poet of the Panama Canal construction field:

Here we are, gentlemen; here's the whole gang of us,
Pretty near through with the job we are on;
Size up our work—it will give you the hang of us—
South to Balboa and north to Colon.
Yes, the canal is our letter of reference;
Look at Culebra and glance at Gatun;
What can we do for you—got any preference,
Wireless to Saturn or bridge to the moon?

Don't send us back to a life that is flat again,
We who have shattered a continent's spine;
Office work—Lord, but we couldn't do that again!
Haven't you something that's more in our line?
Got any river they say isn't crossable?
Got any mountain that can't be cut through?
We specialize in the wholly impossible,
Doing things "nobody ever could do."

Take a good look at the whole husky crew of us,
Engineers, doctors, and steam shovel men;
Taken together you'll find quite a few of us
Soon to be ready for trouble again.
Bronzed by the tropical sun that is blistery,
Chockful of energy, vigor and tang,
Trained by a task that's the biggest in history,
Who has a job for this Panama gang?

The Teaching of Architecture on the Pacific Coast*

By WARREN C. PERRY

I HAVE put down as a title to this paper, "The Teaching of Architecture," partly because it is necessary in such cases to forestall inquiry and possible derision by having a title; and partly because it seemed less overwhelming to live up to "The Teaching of Architecture" than to the mighty subject of "Education" which our friend, Mr. Lawrence, was so good as to flatter me with.

It has doubtless occurred to you already, what I find myself conscious of, to-wit: "That it scarce behooves one of my age" to be prattling on a topic that greybeards are said to be at their wits' ends over, that it would be far more fitting for me to come before you in the capacity of a trembling student to be catechised than staggering under the tremendous title of "Professor," which I regret to say does not belong to me, save by the most extreme courtesy.

Having thus made my excuses for appearing to pose thus, as an authority, I find myself really very glad to have this opportunity of setting down roughly a number of things that have come to my mind during my brief two years' teaching experience. I will try to avoid ideas which have come to me through others, and set down conscientiously my own alone, though of course many of these will be common gossip for most of you.

First: A purely selfish observation—he who teaches learns ten times as much as he who is taught—therefore, let us one and all start "ateliers." I think that this is more true of Architecture than of almost any other subject, for it invites to a sublime degree, the study of not only the "five orders according to Vignola," God forbid! but of humanity, of as many individualists as one has disciples,—each one a living bundle of enthusiastic tendencies, good, bad and indifferent.

If architecture be not the study of humanity, whatever is it? It means the being prepared (for a stated period each day in my case) to face a thousand searching questions on the history, theory and practice of this vast subject, which are being constantly concocted by an interactive group of unfettered and exceedingly restless imaginations. Happy is he who has left a row of conveniently disposed loopholes along the pedagogic path, through which he may slip, on occasions, with small loss of dignity, and, I may add, thorny is the way of him who has been wont to say with firmness—"Never do this!" "Always do that!"—for he will be tripped headlong over his own foolish phrase, again and again. Also this: A class may forget the name of the architect of the Parthenon, or the principles of Gothic construction, but never will it fail to call to mind a famous building which flaunts itself in the face of one of your "Don'ts" or "Always's," however obscure that one may have been.

But I digress. It is my intention to set down the three systems that prevail for the teaching of architecture, briefly and comparatively, and then to draw conclusions therefrom. These are, namely: the Ecole des Beaux Arts in Paris, the educational work of the American Society of Beaux Arts Architects, and the school of architecture at the University of California, with all of which I have been somewhat familiar.

The Beaux Arts in Paris, where I was a student for two years and a half, is, as we all know, the distinguished prototype of many schools in America, and is, I think, the most efficient and at the same time the

*Paper read before the Architectural League of the Pacific Coast at Portland, Ore.

most elastic system in practice. But I wish to make myself clear here, upon one point. I refer to the organization of the school, not to the "Projets" produced therein, and while I am loyal to "l'Ecole" to the point of sentimentalism, I am fully aware that it is the outgrowth of very different conditions, a different people, and a different culture than ours. There is nothing, you will agree, more exasperating than to have someone say, upon hearing that you have worked in Paris: "Oh, you do nice Frenchy things!" or "horrid Frenchy things," as the case may be. I remember, on the eve of my departure from California, a certain "nearlover" of the arts, who rode on a street car two miles beyond his street, in a vain endeavor to convince me that I was headed straight for architectural damnation, in going abroad to study.

The school in the rue Bonaparte in Paris is, as most of you know, only a rendezvous, and represents the theoretical part of the work. The actual study of design is carried on in a number of "ateliers," presided over by the most distinguished practicing architects of France, which are situated variously in that part of Paris lying between the boulevard du Montparasse and the river.

The keynote of this situation is to me wholly logical, being based upon the covering of certain work rather than a number of years residence. One passes entrance exams (if he is lucky); these come every six months and are competitive, admitting some sixty men each time out of six hundred applicants. This sets, at the very beginning, a high standard of excellence, making membership therein alone, of a distinctive value. It furthermore insures a degree of proficiency in fundamental subjects, principally, and, I do not hesitate in so saying, descriptive geometry. O, Descrip! What sins are committed in they name! How many of those ardent ones who indulge themselves in the design of buildings, really feel the bones of their recreation, really know clearly and sharply in every chink and corner how they will look in execution? How many "cartouches" alas! cover surfaces that come altogether along strange and uncouth lines? I am sure that no one who has been patted on the back by that fine old apostle of "Geometric Description," Mr. Pillett, can ever be aught but a firm believer in its importance.

Success in the entrance exams of l'Ecole places one in the "second class" where, if he wishes, he may do "second class projects" up to his fateful thirtieth birthday, on which date he must leave, whatever his status. He need render but one projet a year to remain on the rolls, that is all. If, however, as is usually the case, he desires to advance, there are approximately two years of drawing, perspective, stereotomy, higher mathematics, and construction, besides six values in architecture between him and the coveted "first class" from which, in the course of time, after gaining ten values in architecture, he is privileged to do his "diplome" or thesis.

But see what freedom this leaves the man! He may work in an office, thereby earning the money to continue a four months more at school; he may travel if commanding the means, almost whenever the mood takes him. He is at complete liberty to establish his own scheme in life. He is upon his own responsibility from the very first, for, saving perhaps in the atelier, the school is the most impersonal organization in the world. There is no molly-coddling there, anyway, and in my recollection there were certain crises which came pretty near to counterfeiting the stern realities of life. A great school, deeper seated than in the personnel of its staff, its sound organization has brought it down to us from the days

of Louis the Fourteenth, majestically surviving all the fads and caprices that every few years seem to change the standard aspect of its work. It is a mighty institution. If you do not believe it, look at the last thirty years of American architecture.

The next system I mentioned for discussion is that of the American Society of Beaux Arts Architects, which is based on the Paris school, with this great difference, that we, on the Pacific Coast, are as far again from New York as New York is from Paris. Imagine men in New York rendering problems in Paris! You who have worked in the Ecole des Beaux Arts remember the few sets of drawings, which represent the "regional schools" at Lille, Marseilles and Lyon, and how "out of things" they seemed, developed as they are, only a day's journey from the center, and that despite the fact that their patrons are Paris men. Which brings me naturally to the thing that I feel most deeply in all this educational work—that teaching must be personal, that the teacher must give of himself to the men under him; it cannot be conducted at arms' length or, what is worse, at continent's breadth.

We make use at the University of California of as many of the Beaux Arts Society programs as we can fit into our calendar, but during last year, especially, many of them have been rather poor; ambiguous in language, and replete with such easily foreseen faults as requiring drawings at scales too large for the paper demanded, etc. All this could have been averted, or at least readily corrected, had the headquarters been in San Francisco instead of New York.

I do not mean to attack the Beaux Arts Society. Its work is excellent, and it will continue, I hope, to prosper, but it benefits most the region immediately around New York, which of course, was the original intention. I maintain that it is for us a little too much of a "correspondence school" and with profuse apologies where due, I insist that whatever may be true of other lines of work, Art, and Architecture in particular, cannot be taught through the mails.

Finally, to sum up the situation at the University of California, we have a collegiate school of architecture, which, under the devoted guidance of John Galen Howard, has been built in the course of a decade from out of rather hostile material, a flourishing and enthusiastic body of some fifty-odd students, housed in an interesting building, that is at once their workshop and their club. It is a close corporation too, with its own laws and customs, fasts and feast days, eyed with curiosity by the rest of the University, as being of strange and somewhat foreign character, but approached, hat in hand, as partaking of something vaguely artistic. And, Heaven be praised! it has already built up, around a nucleus of strong and clever young men, and I must add women, an atmosphere and ideals of its own. I do not need to tell you what that means.

In regard to the scheme of work, which I believe to be about the same as in most University schools, it may be stated that students do not begin work actively in architecture until their third college year, it being deemed necessary for them to become firmly established on a collegiate basis first, both in general subjects and in those which serve directly as a foundation for their future work in architecture.

Once in the "Ark" as it is called, they are required to do a given number of projects per year, usually five, with interpolated "esquisse esquisses," carrying on simultaneously their work in other departments of the University, such as engineering, language, etc. They are given grades upon their projects, which are also exhibited in order of excellence, and,

as in other University work, these grades are averaged each term, this being necessary to put the work in architecture upon a common basis with other University work.

It occurs to me to jot down here an idea on collegiate schools in architecture. I think, and our experience will somewhat bear me out, that art schools, where established in connection with academic institutions, should be put upon an independent basis from the very first. That is, not made to conform to the same unit as Letters, Social Science, Commerce and what not, but free to grow in its own fashion. There is something so radically different in the nature and atmosphere of the two that it is cruelty to impose rules and hours. Academic work is inherently regular art work, essentially, spasmodic—the laity can never understand this quality—and call it the result of chronic procrastination, but I notice that "charettes" will happen in the best regulated schools.

If, then, a school of architecture is to be set up in a university, let it be upon broad and independent lines, from the beginning. I might tell you much more of the university had I time, for I have gotten to be very fond of the work there, affording, as it does, a change from the official routine which occupies the rest of the day.

I think, incidentally, that every one who can should teach. I think that no one should teach who is not doing active work, too. Now, a college course is well enough for men who are able to devote four or five or six years' entire time, save the summer, to their education, but it is not feasible for those who must needs earn their way from day to day, as is the case with most office men.

So much for the three types. Now, if you will permit me, I should like to outline a plan which is possibly not original with me, either wholly or in part, but which appeals to me as one which may be made to keep pace with coast development, insure the unified interest that forms the chief reason for being of the Architectural League, and at the same time would bring about a closer bond between patron and student.

Why not establish at, say, four points—Seattle, Portland, San Francisco and Los Angeles—four architectural schools, these being separately maintained institutions, financially and otherwise; these four schools forming collectively the Architectural League of the Pacific Coast, educationally speaking.

Why not have each of these schools composed of the ateliers in the immediate vicinity of each of the cities mentioned, with power to award recompense to "projets," which same might be issued simultaneously in each of the four, this power (of judging) to be safeguarded by a governing committee, chosen, like the present one, from the territory under consideration, the members of which committee, for instance, writing the programs.

At stated periods, twice or four times a year, there could be held in different cities in rotation, general exhibitions of all work, and certainly general competitions, open to the whole coast, as, for example, the one which we have just had the pleasure of judging.

I should have each school housed in its own district and separate rooms or buildings, common alike to all the ateliers of the school, with suitable provisions for leaving drawings on exhibition after judgment, and, as soon as possible, short courses of lectures, with examinations and records of them. I should like to see, for instance, examinations in our old friend, "descriptive geometry," history and mathematics, standing between the "analytiques" and the regular "Class B" projects. You know as well as I do what a jump it is for a lad to start his first complete building with

nothing but fragments and orders in his head; and I would like to see a comprehensive course in construction between the work corresponding to that of "Class B" and that of "Class A," with efficient examinations attached.

The Architectural Club in San Francisco maintains, by means of lectures, a course in construction, but this is, I believe, without examinations and is kept distinct from the designs. Also, while the judgments and exhibitions of the Beaux Arts Society are held in its rooms, it is primarily a private and social club, and I believe that I am not alone in the feeling that it would be better to have a common meeting ground for the scholastic part.

Now, all this must needs come slowly; doubtless all the four schools would not be started at once, and I should think not before the need becomes apparent, but being a system of units this would not impair the whole design.

To sum up: (1) I would suggest that we write our own programs on the coast, as well as judge our own problems; (2) let there be in each center a common headquarters; (3) let us have the delightfully green fields of architectural design marked off by stern walls of descriptive geometry and construction; it makes them all the sweeter when they are finally attained.

It seems logical. I should like to see it tried. It is, after all, only a particularizing of the idea of the Architectural League as imagined by its founders, with the substitution of larger units for smaller ones, to the betterment of those concerned.

If it be the tendency of collegiate schools of architecture to become pedantic and archeological, to get away from the live conditions of actual problems, it is equally, I think, the tendency of ateliers composed of men, who too often have had no chance to lay out the broad lines of a general educator, to become addicted to "paper architecture" and rely upon brilliancy alone, rather than upon the significance and beauty of the forms employed. Why not aim at least at the best in both?

Lastly, in regard to that smallest unit of all, the "atelier," I do not need to remark that this is the most vitally important of all; whatever the scheme of the whole, strong ateliers, built up of enthusiastic lads and sane, interested and interesting patrons, are the bone and sinew of the great school of art. They must be personal—man to man, my old theme, you see.

I have heard it quoted, as a belief of one of the most widely known men of the faculty at Berkeley, that the freshmen in college should be entrusted to the highest paid and most distinguished professors; that, at the precarious period of initiation into a line of thought and work, the novice should be in the most expert hands; later, when his own opinions gain strength, he may be safely left to the companionship rather than the guidance of younger men. I agree heartily with this myself. This scheme does not prevail, however, needless to say, for at present it is I who have the proud privilege each year of ushering a new class into the wondrous domain of architecture!

Did I say architecture? I should have said, more broadly, "Art," for it is far from rare to find men who insist that the design of buildings is merely applied civil engineering. It has, in fact, been my experience that the first six months of the junior year, nominally, with us, devoted to a study of the orders, must really become a period of getting acquainted.

I can't pretend to teach anything to one whom I do not know, or what is worse, who does not know and trust me. I find I must often

hob-nob with him for days, or weeks even, over any subject but architecture, before I can get him to show me what poetry there is in him. American lads are slow to lay bare that side of themselves. I must overcome a hundred little college sophistries; I must meet a chap considerably more than half way, and on ground familiar to himself.

I have caught a boy's interest by his ambition to produce watercolors, or his interest in "mission style" furniture, or even such things as his love for horses or baseball.

I am quite sure that my choice of architecture as a profession was directly due to the construction, one summer, just ten years ago, of a massive oak table, after a design by one Will Bradley, which I found among the chaste pages of the Ladies' Home Journal.

It is such a vast subject, in all its phases, that one of a thousand different aspects may have attracted one into picking it for life work.

Now, it surely is the business of him who is said to be teaching this mighty affair, to do his best; to single that point of view, and through it to reach the artistic being within to the best of his poor ability, rather than try to foist a uniform and ready-made doctrine on a terrified neophyte.

Give of yourself to your student; unbosom yourself before them, and they will not be slow to do the same before you. That is the thing that animates the dry bones of teaching into a living thing of flesh and blood; three years ago, I myself was a student, and that is too recent for me to forget the pains and pleasures and vague dreams of the future. As long as it falls to my lot to be called a teacher, I pray that I may never be unmindful of these; humanistically speaking always stay at the age, like Peter Pan, of those with whom I am playing.

Of the experiences which have befallen me, I have never met with two more exquisite than that of surprising a fellow into his admission of his love for the beautiful and that of watching his pride in its growth after the confession; it is a more than ample reward.

* * *

Building of Glass Twelve Stories High

SOMETHING of a novelty in commercial buildings has been commenced at the corner of Tenth avenue and Thirty-sixth street, New York City. The architects, Goldwin, Starrett & Van Vleck, have provided plans for a twelve-story skyscraper, in which the entire front of the building and its interior sides are to be of glass. In fact, 78 per cent of the walls will be of this material. There will be no openings in the glass facade except those in the front of the building for emergency purposes, but which will not be visible from the street. Ventilation will be accomplished through a specially devised system of ducts, through which will be forced cooled and washed air, let into the offices at whatever temperature the tenants may desire. Humidity will be an unknown quantity, as it will all be washed out of the air, which will be cool, dry and free of all dust. In the winter season this same system will furnish heated air.

Vibration, usually noted in buildings where heavy machinery is operated, has practically been eliminated, and anti-noise has also received attention in other directions. All floors are to be rubber tiled.

It is estimated that the structure will cost approximately $600,000, of which amount $78,000 will cover the cost of the glass. On the interior the glass will be a specially polished plate, and for the exterior surface will be specially treated plate that will not transmit heat waves into the interior.

Architect's Perspective Municipal Natatorium, San Jose, California
William Binder, Architect

A Municipal Natatorium of Reinforced Concrete

By O. P. SHELLEY, Assoc. Mem. Am. Soc. C. E.

IT HAS remained for San Jose, Santa Clara County, California, popularly known as the "Garden City" and claiming only 35,000 population, to achieve what has not yet been attempted by the city of Oakland with ten times the number of inhabitants, nor by the city and county of San Francisco, which claims nearly fifteen times the population of San Jose. In fact, San Francisco has formally declined the offer of the trustees for the Lick Baths and the Sutro Baths that these be turned over to the city and county of San Francisco to be operated as municipal bath houses. It is well to ponder on these facts in considering the San Jose Municipal Natatorium, a study of which is presented below and an exterior view of which appears over this article, for this is without doubt the finest bath house in the West.

The Natatorium is situated in Alum Rock Park, which is the municipal play ground for the city of San Jose and is situated some seven miles due west of that town in the foothills and is served by rapid electric transit over the Peninsula Railway.

The reader will readily appreciate from the perspective shown that William Binder, the architect, has correctly interpreted the spirit of the old Spanish times in the Mission architecture, with its white cement walls, their inlay of dark red tile and the red tile roof over the main front portion; the whole harmonizing with the trees and hills in a manner which makes it appear as if it were a part of the surroundings.

The plan of the Natatorium was very carefully worked out both with the idea of avoiding confusion when crowded with people and to obtain compactness of the entire building.

On entering, the ticket office lies on the left, and the superintendent's office on the right, while directly ahead is the main plunge with the dressing rooms of which there are seventy-two on the main and mezzanine floors, these being divided again into sections so that more or less sections may be assigned to the use of men or women as need may arise.

There is a large wing at each end of the plunge or main section devoted respectively to men and women and each containing a rest room, massage room and hydrotherapeutic room, as well as individual tub baths of which there are thirty-three in the mens' section and eighteen in the women's. Under the women's wing there is a basement containing a

mechanical equipment consisting of a complete laundry, pumps, heaters, ventilating fans, etc., the entire cost of this mechanical equipment being about $9,000.

Fig. 1

The fact that sulphur water would be used in the baths necessitated a great deal of study on special means and equipment to avoid the use of marble, steel or, in fact, exposed metals of any kind, as the sulphuric acid carried in the water rapidly discolors and in time destroys all these materials. For this reason tiling was used exclusively instead of marble, and aluminum hinges, door locks, etc., had to be specially made. However, the appearance of the tiled wall partitions are so superior to marble that tile should be largely used in such places in future for appearance alone.

It is a notable fact also that the solid partitions tiled on both sides did not cost as much as the best quality marble with the necessary fittings.

The general plan of the building has already been mentioned and must be borne in mind when considering the various parts of the work. It is certain that the lay-out succeeded in obtaining what is usually lacking in bath house construction; that is, having dressing rooms and plunge in close proximity, while the machinery being situated in the basement of one of the wings, avoided an unsightly power house, which would have been an added expense and, in addition, puts the machinery close to the work which it has to accomplish. The lighting was taken care of by liberal skylights, over both the wings and the main portion of the building and results in an extremely good and even light throughout, enough windows being used in the wall where required, and serving to avoid any monotony in the architectural effect.

The use of reinforced concrete for the structure of the building was only logical, as it is certainly the material best lending itself to the construction of this type of building; while the use of wooden joist and sheathing for the roof was also logical, as there would be no danger of fire except from brush, which could not possibly reach the roof. The use of wood in this part and also on the balcony therefore cuts down

Fig. 2

Fig. 3

on the dead load, as well as somewhat reducing the cost.

In the structural design, H. J. Brunnier, Consulting Engineer, has shown much originality in the construction, the interesting points being the reinforced concrete slide, the diving or spring-board platform, the partitions round the individual bath rooms and the arched bow-string trusses for the roof; all of which points are well worth considering individually.

On making a study of the bibliography bearing on the subject of reinforced concrete slides, spring-boards, platforms, etc., where used in connection with swimming pools, there seemed to be no mention of previous designs by which to be governed; therefore the design in this case is wholly original. Extreme smoothness being necessary for the curve of the slide, this was figured to conform to a parabolic curve $Y^2=4AX$; ordinates being figured for every horizontal foot, the slide itself being 33 feet long and 21½ feet high, measured along the co-ordinates. The slide as well as the spring-board and the arched trusses are very clearly shown in the interior view of the building (Fig. 5), while the working details of the elevation and cross-section of the slide are shown in Plate 4.

The slide was figured as being suspended from the platform and the steel was so placed as to take care of the resulting strains, column No. 5 supporting the cantilevers from which the slide and platforms are suspended. In the plan of the top of the platform it will be noted that one cantilever is connected rigidly to an exterior column, while the other cantilever frames into a six-inch wall, the one framing into the column might in certain cases be thrown into tension and was therefore thoroughly tied to the column, as shown in the working details.

The steps leading up to the platforms and platforms themselves were all of cement finish, while the slide itself was terrazzo finish to insure absolute smoothness and therefore lack of friction. In addition to the slide, two diving platforms also extend outside of the larger platform at the nine-foot and eighteen-foot elevations, the entire arrangement making a very rigid structure and very pleasing in appearance.

The diving or spring-board platform was also constructed of reinforced concrete and figured as a cantilever, so as not to have any obstruction in the tank proper; Fig. 6 showing the placing of the reinforcement and the method of framing the spring-board into the platform. It will be noted that there are two cantilevers, both being eight inches in width, one on either side of the spring-board platform, the surface of the platform being of roughened cement finish to afford a good grip for the feet.

The third item of great interest in the bath house are the partitions around the individual bath rooms and which are clearly shown during construction in Figures 1, 2 and 3, being respectively before plastering,

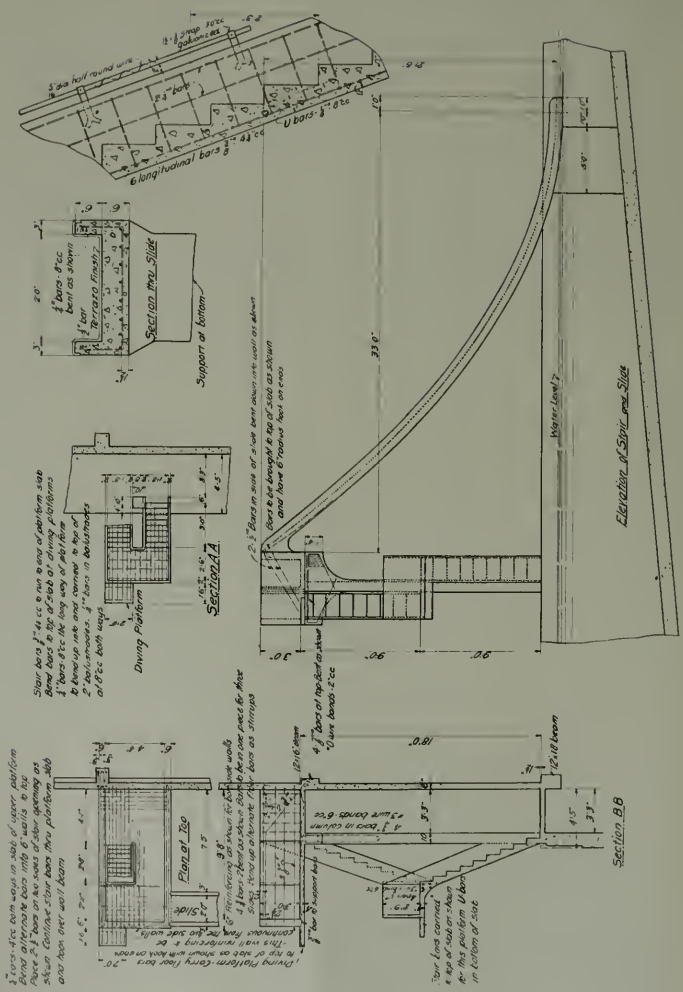

Section A A
Diving Platform
Section thru Slide
Support at bottom
Elevation of Stair and Slide
Water Level
Plan at Top
Slide
Section B B

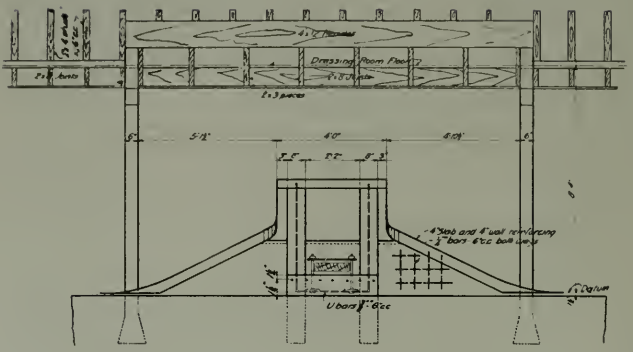
Fig. 4

Fig. 5. View of Swimming Pool, Municipal Natatorium, San Jose
Note Concrete Slide on the Right

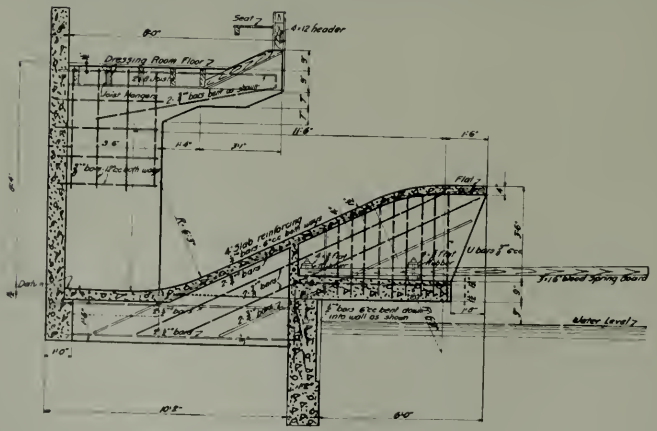
after plastering and after tiling. The conventional way to have arrived at this would have been to use marble partitions, but the desire was something not only safer on account of the difficulties from sulphur water previously mentioned, but something decidedly better, and also to leave the room more unobstructed by doing away with the numerous ties over the doorways, etc., in the shape of bracing, which would have been absolutely necessary with marble. To accomplish the end desired, it was necessary to find something decidedly stiffer than the customary lath and channel partitions, and also something which would not require rigid steel framing around all the partitions and the only solution of this difficulty seemed to be in the use of "Self-Sentering," the final construction being very clearly shown in illustration No. 3.

It will be noted that absolutely no framing was used in these "Self-Sentering" partitions, with the exception of a channel iron on each side of the door, which was securely dowelled into the floor slab; the "Self-Sentering" running with the ribs horizontal from channel to channel, and the intermediate partitions being tied into the partition at the front, or passageway, and into the wall at the back. Fig. No. 1 of the partitions in place ready for plaster, shows the temporary bracing used, which was made removable and which you will note is disappearing in Fig. 2 which shows the partitions plastered ready for the tiling.

It should be borne in mind that the thickness of the channels at the sides of the door openings and therefore the thickness of the plastered



Elevation Looking from Inside of Tank



DETAILS OF SPRING BOARD

Fig. 6 Municipal Natatorium, San Jose. H. J. Brunnier, C. E.

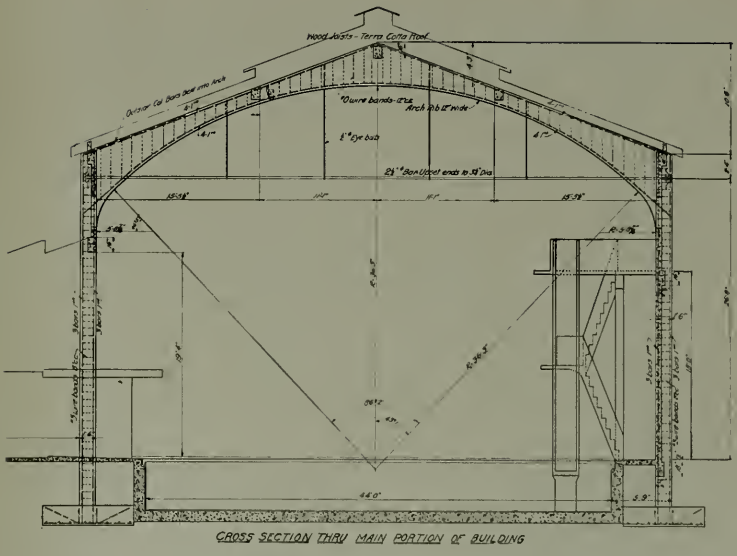

Wood Joists - Terra Cotta Roof
Overlap Cal Bars 2x6 cms thick
10 wire bands - 12" c.c.
Arch rib 12" wide
1" Eye bolt
24" Bon Ubbel ends to 18" Dia
CROSS SECTION THRU MAIN PORTION OF BUILDING

Fig. 7. Municipal Natatorium, San Jose, California
William Binder, Architect. *H. J. Brunnier, C. E.*

partitions, was only one and one-half inches, and this must be borne in mind when considering the great rigidity of the completed partitions. After the plastering was done, these were tiled on both sides and edges, with glazed tile by the Mangrum & Otter Company of San Francisco. The completed partition being shown in Fig. 3, and indicated very clearly, the bright sanitary appearance of the room; the floor, of course, being tiled but showing in the pictures as covered with sand, which was placed there to protect it during the plastering. It will be noted in the final Fig. No. 3 that there is absolutely no bracing whatsoever over the doorways, and it is a marvel that these partitions are so rigid by placing both hands at the top corner of the partitions and exerting considerable strength it is not possible to even get a tremor out of them, all of which speaks volumes for the rigidity of "Self-Sentering" solid partitions and the cheapness of their erection.

The design of the bow-string arched trusses was also interesting. By nature of their construction they were considered as fixed-ended and figured for a dead load of forty-five pounds to the square foot and a live load of twenty pounds, exclusive of the weight of the arch itself; and in addition, the arches were figured for a rise and fall of temperature in either direction of 50 degrees, or a total range of 100 degrees Farenheit. It will be noted from Fig. 7, two and one-half-inch tie-rods upset to three and one-quarter inches in diameter at the ends, were necessary to take the maximum horizontal thrust, while the arches themselves

were reinforced with four one-inch bars, top and bottom, with vertical stirrups composed of bands of No. 0 wire placed twelve inches on centers. The two and one-half-inch diameter tie-bars were held in place by one-half inch eye bolts suspenders anchored into the concrete arch rings, all the structural details of the arch being very clearly shown in Fig. No. 7, as well as in the general interior view, Fig. No. 5.

Z. O. Field of San Jose was the general contractor and the contract price of the entire natatorium complete was only $78,000, of which $12,000 was for tiling and $9,000 for mechanical equipment, leaving only $57,000 as the cost of the remainder of the work.

It is also worthy of mention, because it is the exception to the rule and speaks for the completeness of the plans, that the "extras" on the entire job came to only $305, which is less than two-fifths of one per cent of the contract price.

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* *

Two Interesting Designs by Messrs. Welsh & Carey, Architects

ON the east side of Diamond street, between Elizabeth and Twenty-fourth streets, San Francisco, there has just been completed a two-story and basement frame building, to be used as a parochial residence for the fathers of St. Phillips' Church.

The exterior is finished in cement plaster on metal lath, with wood window and door trim. The style is late Gothic. A spacious basement under the full length of the building will be used as a parochial hall for the neighborhood.

The illustrations of the first and second floors show the arrangement of the rooms. The interior finish is all in character with the exterior.

A new Masonic lodge building, now in course of construction at Guadaloupe, promises to be one of the artistic structures of the town. It is built of brick and is two stories high with mezzanine floor. The facade is interesting and quite away from the ordinary commercial lines, although a large store is provided on the first floor, suitable for a bank. The lodge and banquet rooms are on the upper floors.

The plans for both buildings were prepared by Architects Welsh & Carey of San Francisco.

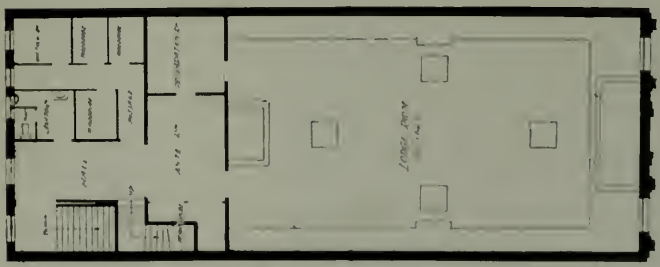
*
* *

His Boss in a Hurry

A negro was driving a wagon, and in going through a street ran against a funeral. With the superstition of his race he thought it would be bad luck to cross behind a funeral, so he tried to cross ahead of it, but the driver of the hearse whipped up his horse, and the two went neck and neck for a time until the darky sang out:

"Say, dah, pull up younh hoss! Mah boss is in a hurry an' younh's isn't."

Masonic Temple, Guadalupe, California
Welsh & Carey, Architects



Second Floor Plan, Masonic Temple, Guadalupe, California

Parochial Residence, St. Phillips Parish, San Francisco
Welsh & Carey, Architects

First and Second Floor Plans, St. Phillips Parochial Residence

Carved Marble Furniture for the House Beautiful*

A Marble Bowl

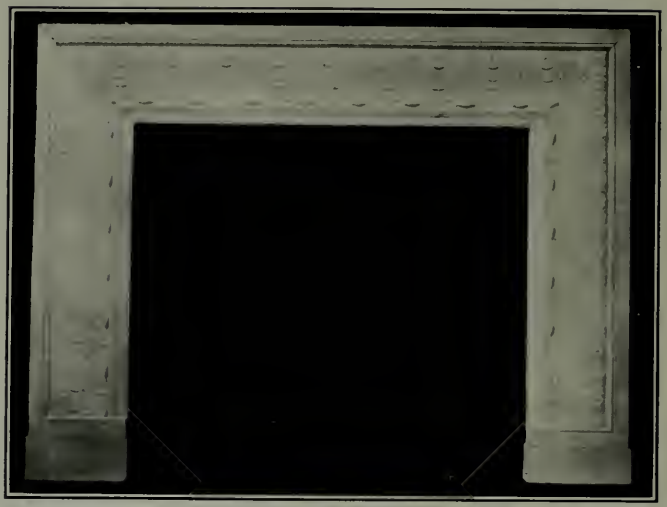
WITH the increasing demand for cement exterior homes has come an equally popular call for out-door features, such as patios, Pompeiian courts, sleeping porches, etc. The tendency seems to be to make the out-door life of the home as comfortable and attractive as the indoor and to that end the architect endeavors to provide such luxuries and conveniences as will appeal strongest to the owner.

One of the very latest acquisitions to the well-appointed city and country house is garden furniture carved in marble and stone. Too expensive? No, indeed, at least not for the better class of home building. Of course, the furniture can be made as elaborate as the owner wishes and when the material is of an especially high grade and the carvings unusually rich the cost is naturally considerably more than when the work is less pretentious. Many exquisite designs in chairs and tables, flower bowls, electroliers, etc., are possible, including examples of the work of the famous craftsmen of the fifteenth century (Italian and French Renaissance).

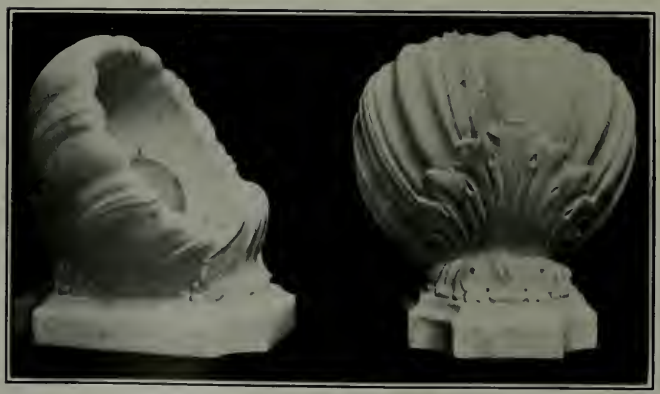
The accompanying illustrations are made from photographs of work executed by the Italian artist, G. Civale, and give the reader a general idea of the wonderful possibilities of hand-carved marble for useful as well as decorative purposes. In the statuary work the artist combines the ornamental with the useful; the electrolier, for example, is used as a postcap at the foot of the stairs or can be suitably fitted for either or both ends of the mantel piece. Italian statuary marble is generally used for this class of work. The marble mantel piece is also much in demand and where years ago the mantel was severely plain today it is decorated with delicately chiseled figures or cleverly molded flower effects.

Baptismal Fount, First Presbyterian Church, Oakland
W. C. Hayes, Architect

*Illustrations are from photographs of work executed by G. Civale, studio, 1644 Stockton street, San Francisco.



Carved Tennessee Marble Mantel in Residence of Architect G. Albert Lansburgh, San Francisco



Carved Electrolier in Italian Statuary Marble

Mantel of Manti Stone and Tavernelle Marble in Home of Attorney Beatty, San Francisco
Frederick H. Meyer, Architect

Manti Stone Mantel, Residence of Mr. I. W. Hellman, Jr., San Leandro
Frederick H. Meyer, Architect

Marble Flower Bowls

Garden Furniture at Haddon Hall, Oakland, by Sarsi Studios

First Methodist Church, Oakland *Norman F. Marsh, Architect*
Faced with Sacramento Sandstone Brick

The Price of Ignorance

The Builder of London strenuously protests against what it regards as the woeful ignorance of so-called educated people in matters of art. In a recent issue it states:

Mr. Arthur F. G. Leveson-Gower gives some interesting facts bearing on the fate of the magnificent woodwork of Winchester College Chapel. He states that in saying the authorities broke down, cast out, and sold the woodwork for £100 Mr. Benson is far short of the mark. He alleges that it became the property of a contractor without payment, was sold by him to an ecclesiastical dignitary for £50, and that the latter, not being able to re-use it, sold it again. Mr. Leveson-Gower discovered it some ten years ago in the possession of the next owner, who was willing to part with it for £1,200, but the Winchester authorities refused to entertain the idea. It was then bought by an architect and sold for something approaching £30,000, and is now a feature in a private house near Winchester. Mr. Leveson-Gower wishes that the owner could see his way to restore it to the Winchester authorities, but adds, somewhat ironically, that such an offer could be safely made, as such things do not appeal to the authorities of Winchester College. We consider this a very pertinent instance of the damage which takes place and the loss of artistic value that goes on throughout the country from the gross ignorance which very often distinguishes even the so-called educated classes in matters of art. That the governing body of one of our great classical schools should have so little knowledge of the value of the historic works of art of which they are the custodians is, we are afraid, not an isolated or exceptional case of ignorance of those in authority in this country.

* * *

Scale of Wages in the Building Trades

IT is always a source of much interest for those associated with the building industry to note how wages of mechanics in the various branches differ in one section of the country from those which obtain in places more or less remote thereto; as, for example, how the rates in leading centers on the Atlantic seaboard compare with wages received by the men in some of the principal cities on the Pacific Coast. In the table presented herewith the country is roughly divided into three zones and a few of the leading cities selected from each. The figures are taken from the official schedule of 65 cities in the United States and Canada compiled by E. M. Craig, secretary of the Builders' Association, 808 Chamber of Commerce Building, Chicago, Ill., and corrected up to July 1, 1913.

It will be seen that most of the trades operate under an hourly scale, but some are paid a stated sum per day. A comparison of the figures presented with those published a year ago will readily show the changes, if any, which have occurred in any particular city of the country covered by the schedule.

In addition to the information given in the table it may be stated that in Boston plasterers' laborers receive 41½ cents per hour and metal roofers 55 cents.

In Cincinnati laborers work nine hours per day beginning October 1, 1913.

In Los Angeles plasterers' laborers receive 50 cents per hour. At the time the chart was compiled carpenters and sheet metal workers had asked for an increase of 50 cents a day in wages and electricians nine hours.

In St. Paul hoisting engineers, elevator constructors, roofers and laborers work ten hours per day.

Rates of Wages, Per Hour, Paid in Various Branches of the Building Trades

Name of City	Masons and Bricklayers	Structural Iron Setters	Plasterers	Lathers	Plumbers	Steam Fitters	Carpenters	Painters	Sheet Metal Workers	Electrical Workers	Roofers	Cement Finishers	Laborers and Hod Carriers
Boston	65	56¼	65	$2.75 $3M 60c hr.	62½	50	55	50	45–55	37½ to 56¼	Comp. 28–43¾ Slate 55	62½	L. 25 H.C. 30–40
Hartford	65	50	65	50	55	54	50	45	45	40	45	54	L. 25 H.C. 37½
Newark	65	56¼ to 62½	65	50	62½	56¼ to 60	50	47½	60	56¼	Slate 60 Comp. 40	60 to 65	L. 25 to 30 H. C. 35
Philadelphia	M. 55 B.L. 62½	60	62½	Wood $2.50M Metal 56¼	43¾	43¾	50	40	45	40	45	45	37½
Washington	66⅔	50	62½	$2.25 per M	50	50	50	50	50	55	50	45	L. 18¾ H.C. 28¾
Atlanta	45	62½	45	30	50	45	30	30	40	40	35	45	15
Jacksonville	B.L. 62½	43¾ to 50	56¼ to 62½	37½	56¼	56¼	34⅜–37½	34⅜–37½	37½	45 to 50	37½	....	L. $1 50 H.C. $1.50–1.75
St. Paul	M. 55 B.L. 65	50	62½	Wood 4 a yd. Metal 55	62½	56¼	40 to 50	50	40	40 to 47	Grav. 30–35 Slate 40–45	50	L. 22½ H.C. 30 to 35
Chicago	75	68	75	71⅞	75	75	65	65	65	75	65	65	40
Cincinnati	M. 60 B.L. 70	62½	68¾	.....	62½	52½	50	50	40 to 45	50 to 55	40 to 45	50	L. 25 H.C. 25 to 32
St. Louis	M. 70 B.L. 75	65	75	68¾	66¼	75	62½	57½	60	65	55	60	L. 20 to 37½ B. 47½, M. 50
Memphis	M. 65 B.L. 75	62½	75	Wood 50 Metal 62½	62½	62½	50	50	50–60	45	50–60	62½	L. 17½ H.C. 30
New Orleans	62½	50	50	50	56¼	56¼	45 to 45	37½	45 to 45	$4 60 a day	30	45	L. 15 H.C. 30
Denver	M. 62½ B.L. 75	56¼	75	50 to 56¼	62½	62½	60	50	56¼	37½ to 50	37½	68¾	L. 37½ to 40 H.C. 37½ to 43¾
Salt Lake City	M. 62½ B.L. 75	62½	75	62½	75	75	62½	62½	57½	56¼	50	62½	L. 31¼ H.C. 50
Seattle	75	62½	75	62½	68¾	68¾	. .	56¼	56¼	62½	50	62½	L. $2 to $4 50 H C. $4 00
Portland, Ore	M. 70 B.L. 75	75	75	62½	75	75	$4 00 a day	50	$4 50 a day	50 62½	37½	$5 to $6	L. $2 50–$3 H C. 50
San Francisco	$7 a day	62½	87½	75	75	75	62½	56¼	68¾	62½	75	75	L. 31¼ Brick 50 Plas. 62½
Los Angeles	M. $5 50.88⅛ a day B.L. 75	75		$2 25 per M	56¼	56¼	50	43¾	50	43¾	43¾	62½	L. 43⅝ H.C. 67½
San Antonio, Texas	B.L. 87½	62½	75		56¼		45	45		56¼			L. 21⅞ to 25

American Architecture

By F. W. FITZPATRICK*

THE accepted leaders of the profession—in New York, at least—are somewhat at odds as to what ancient style of architecture should be our paramount if not permanent influence in design. One faction contends that only in medieval art, Gothic, may we find a suitable ready-made garb with which to clothe our modern structures, whilst another as sententiously proclaims that it is impossible for us to reasonably express ourselves, with any degree of modernity, in copying that art and that a Renaissance interpretation of the Classicism of ancient Greek Art is the only fitting garment we Americans are justified in borrowing.

Never for a moment is it conceded that we might possibly do a little thinking on our own hook and evolve—from what we know of those ancient arts and of our own needs and limitations—an art that is as personal to us as is the form of government we were daring and progressive enough to establish some decades ago spite of the wise shaking of heads and serious misgivings of our friends, not to mention the more serious and tangible obstructions certain royalties and other reactionaries put in the Colonies' path.

The objectors to Gothic claim, and with justice, that it was a romantic style, its buildings wrought with devoted, emotional hands inspired with religious fervor and a zeal that wotted not of mere dollars and cents, and that it is impossible in modern rush times, with labor geared down to so many blows of the mallet per hour, at so much per blow, to duplicate the spirit of that art and that therefore all we can get out of it is a shallow semblance, a base counterfeit.

The Gothic enthusiasts claim, and with equal justice, that a classic style is absolutely unsuited to most of our modern needs, that with our present construction it is not only meaningless but absolutely untruthful, that its great columns, that of old actually supported the roofs of its temples and baths and basilicas, and now appear to sustain our buildings, carry nothing, but indeed are often even suspended from the steel skeleton and are therefore fraudulent, and that our requirements of light and height are such that the columned porticos and great cornices of classic architecture have no more rightful place in our construction than would a windowless Egyptian pyramid serve as a twentieth century office building.

To me it seems that in their objections to each other both factions are eminently right though, on the other hand, neither has given us anything better to really work with than has the other, and both offer us as complicated, obsolete, as utterly out of date and useless modes of expression architecturally as Sanskrit would be for our commercial and social written communication.

*Consulting Architect, Washington, D. C.

The Classic camp may not have the better of the argument but it certainly has the majority of followers, for the country has gone classic crazy. We have classic churches and classic homes, and classic temples perched up on thirty-storied basements doing duty as skyscraping office buildings, and we have classic markets and ditto dog kennels. Classicism running amuck, a very surfeit of temples, indeed a hackneyed theme, a paucity of architectural expression that is amazing in a people that ordinarily are so fertile of mind and resent so fiercely even the suggestion that they stick to other beaten paths.

It is, of course, heterodox in the extreme to say so but I firmly believe, and long have said so, that it is neither toward ancient Classic Art nor the medieval Gothic to which we should turn our satisfied gaze, but rather should we keep an expectant eye upon—Chicago! Worse than heterodoxy, this must be blasphemy, for has not the East ever looked upon that city with amused contempt and disdain, "Porkopolis," forsooth? And that anyone, particularly one of the East, should call it the birthplace of a National Art surely must make him a fit subject for the pillory of architectural disfavor, nay, even hanging and quartering may be deemed but gentle punishment for so insistent and contumacious an offender.

Years ago Root of that city, realizing that all this borrowed finery set but poorly upon our modern buildings, had the splendid audacity to design one office building that was absolutely devoid of style, just windows and heavy walls, undecorated and unaffected, a building pure and simple. Then Sullivan, of more nimble mind, followed in lighter vein with a building, just as free from Classic or Gothic influence and as frank, but exceedingly ornate. He sought merely to clothe the steel frame (emphasizing and making evident its every part) in a protecting coat (of plastic material) against the elements, and since that material had to be molded and it could as well be ornamented as plain in the molding and at little additional cost, he produced a most truthful, practical, artistic and simple, though a highly ornamental structure, not a "renaissance" of any ancient art but one that marked the real birth of an American architecture.

Other and minor lights have followed in his footsteps and with varying success. At first they were all subjected to scorn, "mere cranks," and they did do some rather freakish things, but of late all that is changed. People generally, even the East, concede that there is something to the movement and that it has its possibilities.

Everything new and really worth while has to pass through such a formative period of riotous liberty before it settles into its proper place. Witness the like Noveau Art movement in France. Its followers (being French), of course, do the most extraordinarily contorted and hideous things rather than follow any of the accepted and orthodox styles. It is revolutionary indeed and all that is old must be wrong and therefore to be destroyed. It is originality gone almost crazy, the upsetting of all precedents, a very bacchanalian riot, the effects of too much absinthe and cigarettes. But out of it all will come good. They seek now but to decorate in weird and grotesque details the actual constructive forms necessary to the service the object, furniture or building is destined for. Time will have its sobering effect, the principle of the thing will remain, will dominate, Truth will be the keynote and Good Sense will be Truth's handmaiden.

So with us. The "Sullivan School" is growing in numbers and in skill, it takes its art more soberly, more seriously and sanely. It is making a place for itself, it preaches Truth in building. Not merely revolu-

tionary as it was at first, destructive, it has now become creative and real, using what it finds good of the old but not slavishly swallowing the whole thing, bait, hook and tackle. Its basic principle is to design a building in plan not so that it will fit some portico or facade of some particular bath or temple of old, but so that it will best serve the commercial, religious or domestic purpose for which the building is intended, and the openings for light and air are placed there where they are needed, and in such sizes and shapes as best serve those needs. Then the structure is put about those rooms, it is of steel framing or of solid masonry mass, as seems best fitted from an engineering point to that particular kind of building. And, finally, the enveloping surface of that structure is made to express both its purpose and its construction, and is decorated as ornately or little with flat ornament, inlays, enamels, colors, moldings and materials as the pocket of the owner will permit or the good taste of the architect sees fit. That's all.

And so, before long, will all our buildings be built, the reaction from ultra-classicism, the advent of the Real. We are coming to it, the dictum of the "leaders" of our profession to the contrary notwithstanding. It is inevitable, an "American Style," and Chicago was its birthplace.

* * *

Pile Driving with Dynamite

A NEW type of concrete pile, which would seem to have little merit except the novel way in which it is planted by explosive force, has been put on the market by the Siegwart Company, of Lucerne, Switzerland. The new pile utilizes the bulged bottom principle common to several patented piles, but is novel in that the enlarged base is formed by the use of explosives. The process of making the pile is described as follows:

An iron tube containing a wooden pile with an iron point and a device at the upper end for deadening the blows of the pile driver is driven into the ground. The wooden pile is then removed and the cartridge provided with an electrical detonator is fixed in position at the bottom of the hole, and the tube is filled with wet concrete, a little above the level of the surface of the ground outside the tube. The iron tube is then drawn up some feet to prevent its end from being shattered by the force of explosion. After the detonation the concrete sinks downwards, filling up the space hollowed out by the explosion. Finally the tube is little by little filled with more concrete, and is drawn up gradually at the same rate as the concrete is filled into it.

After the completion of this process, and after sufficient time has been allowed for the hardening of the concrete, there is in position in the ground a pile with a base of greater lateral diameter than it is possible to produce by any other means. Moreover, on account of the action of the gas formed by explosion, these piles will give the best possible results in compressing the earth. In fact, one pile on this system serves the purpose of several piles on any other system, thus insuring a great economy. By using cartridges of greater or less strength the size of the excavation made by the gas is controlled at will; by the use of a cartridge 600 to 700 grams in weight there is, for instance, made a spherical hollow of three to four feet in diameter, according to the quality of the ground material.—Engineering News.

Keeping the Cost Within the Estimate

HOW to build a $34,000 house for $25,000 is substantially the problem which the average owner vaguely expects architects to solve. Possible variations seldom reduce the inherent difficulties of the task proposed. When a California architect recently failed to perform this financial strategem, he was deprived of his fee by the court, on the ground that "he should have kept the price within the original estimate, if he desired to collect for his services under his contract."

We are not informed as to the exact provisions of the architect's contract with his client, but from published statements it would seem that the client's action in acceding to an expenditure of $9,000 more than was originally contemplated was in itself sufficient to release the architect from responsibility in the matter of cost. However, with our confidence in the infallibility of judicial decisions on matters architectural, we are forced to believe that the architect was at least lax in the protection of his own interests, when he entered into a contract that could be interpreted with such unfortunate results to himself, or failed to have it properly supplemented when it became evident that the owner's demands could not be supplied at the stipulated price.

Everyone concerned in building knows the tendency of wishes to outstrip wealth, but if the client really desires to keep the cost within a stated amount, there is, of course, a way by which the architect with the owner's co-operation can accomplish such a result. It consists in making the specifications both definite and comprehensive, and in so restricting the plans, that the full contract price plus the architect's fee, will be within the appropriation, and leave a small balance as a factor of safety.

If the cost must in some manner be made a condition of his employment, he should conserve the right to modify the specification in consultation with his client, so that the investment may not eventually exceed the contemplated sum. The responsibility for any subsequent deviation from the specifications tending to increase the cost, should then be borne in writing by the client. Such procedure will tend not only to prevent financial disappointment of both architect and client, but also to minimize popular criticism of the supposed extra costs sustained through the employment of an architect.

The method of making the architect's fee contingent in a sense upon the cost of a building, in that a certain amount may not be exceeded without nullifying the agreement upon which he is employed, may or may not have points in its favor, but if the mere mention of a sum as the desired limit of expenditure before plans are drawn, has the legal effect of depriving an architect of remuneration in the event of a larger sum being required to meet the owner's demands, it is important that architects take cognizance of the fact. Moreover the architect should bear in mind that he is not a contractor in any sense of the word and should not enter into any agreement which might prevent his giving disinterested advice to his client.—The American Architect.

* * *

Why Not Build Instead

"I hope you don't object to my children practicing their music lessons," said the fourth floor tenant to his neighbor below stairs. "On the contrary," said the neighbor, "it has given me a first-class reason for demanding a reduction in my rent."—Harper's Weekly.

Electricity in the Sick Room

Luminous Radiator

Cooking and Heating with Electricity

An Intelligent Study for the Progressive Architect

By CHARLES T. PHILLIPS, C. E.*

ARCHITECTS are called upon to furnish their clients with modern ideas, to suggest labor-saving methods and to incorporate in their plans and specifications provisions for those devices that add to the efficiency and comfort in hotels, apartment houses and residences, whether the latter be a mansion or bungalow.

There has been in the last two years such a growing demand for electric cooking and heating appliances that it would be well for architects to acquaint themselves with the possibilities of this mode of heating and cooking before preparing plans and specifications for any of the buildings mentioned in which it is desired to raise the efficiency and increase the convenience and comfort.

The large majority of women who do or superintend their own cooking would be greatly interested in any means which would reduce the labor, dirt and danger that accompany the use of gas, coal or wood, but, while there has been a large amount of money spent in publicity by manufacturers of electric cooking devices, this publicity has not impressed the public with the true merits of this method of cooking.

*Pacific Building, San Francisco.

The study of kitchen arrangement should lead to fruitful labor saving, which is of prime importance in any household, especially if one is seeking a solution of the servant problem. The selection of tools that will best eliminate waste motion is just as important in the kitchen as in a modern factory, and perhaps more so, as factory help is easier to obtain than house servants. It is generally conceded that electric equipment makes the most efficient tools for the housewife or the servant.

So wide is this field today that a comprehensive review of it is almost impossible in a limited space. It appeals fundamentally to those wishing to economize in labor and time.

Devices for heating and cooking by electricity have been in use for twenty years or more, and in the last few years the many improvements that have been made have approximately doubled the efficiency and reliability.

The earlier electric heating apparatus sometimes fell short of practical requirements, especially in relation to handling by inexperienced users; but today they stand on a par in mechanical and electrical stability of construction, flexibility of adaptation and efficiency of operation with equipment developed in all other branches of the industry.

Perhaps no class of electrical apparatus responds more quickly to careful treatment than heating apparatus, but some of the abuses to which this class of apparatus has been put would have destroyed a coal or gas stove in short order.

The principle of all electric heating and cooking devices is practically the same. There is hardly an article for household use that is more simple or more rugged, and, with ordinary care, these devices should outlast a coal or gas stove.

The gradual decrease in the cost of current has brought the operating cost down to where it is possible to prepare meals at about the same cost as with gas, and the use of electric cookers designed along the lines of the fireless cookers should bring the cost still lower.

The electric fireless cooker is extremely convenient besides being exact and highly economical in its results. When one has learned the relatively simple rules for using it, the results are highly satisfactory.

There is another type of electric stove that differs from the kind generally known. Instead of taking a heavy current for the short period of time it is in actual use, it takes quite a small current continuously, or, over a long period of time, storing the heat meanwhile for the intermittent periods of active use. It thus acts as an electric heat accumulator which receives a slow and steady charge and is always ready for immediate use. The same principle is also employed in continuously operated water heaters, for supplying various hot-water hydrants throughout a building or for residence purposes. They have a small, continuous current consumption and the hot water is stored in a thermally insulated tank. Although this type of heater is not in extensive use, it gives promise of highly satisfactory results.

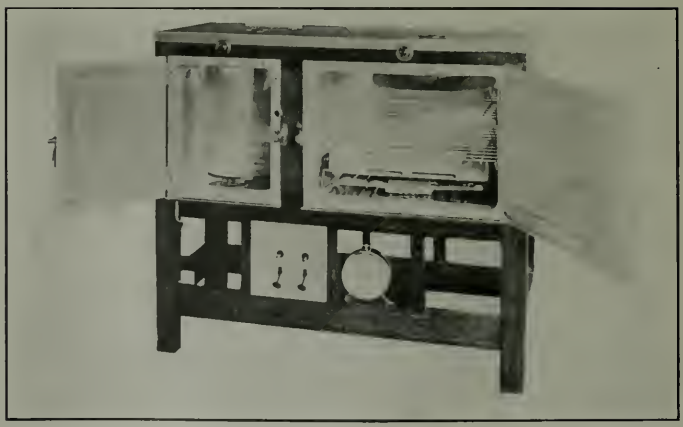
There are two methods of domestic cooking, one being by an outfit of utensils, each with its own heating unit, and the other with hot plates on which ordinary utensils are placed as on a gas range. The first method would appeal to those who are doing light housekeeping, as the cooking can be done on the dining room table, thus saving time, especially at breakfast, when time is limited.

A few of the many electric utensils on the market are small water heaters from one pint to six quarts, combination cookers, tea kettles,

No Smoke, Dirt or Danger

Electric Range, Hotel Type

Electric Range, Family Size



Electric Stove, Fireless Cooker Type

samovars, coffee percolators, chafing dishes, toasters, frying pans, grids, broilers, hot plates and ovens.

There is no odor, soot nor dirt as there is with other fuels, and no products of combustion are thrown out into the air of the room.

There is practically no fire risk, and, in hot weather, the room in which the cooking is done is cool, as very little heat is given out into the room.

Owing to the number of variables which determine the cost of electric cooking, it is impossible to give any set formula for arriving at the cost of electric cooking. The cost of current, the skill of the operator as a cook, the operator's ability to handle the apparatus economically and the type of apparatus used are all factors to be considered. The human equation is the most variable.

The efficiency of a stove using solid fuel is only 2 per cent, there being 98 per cent of the heat units which are lost. A gas stove utilizes 20 per cent of the heat units of the gas, while in an electric oven 90 per cent of the heat energy is used. Commencing with a pound of coal and assuming that it contains 12,000 heat units (B. T. U.), a coal stove will utilize 2 per cent or 240 heat units, a gas stove 600 heat units and an electric oven *767.7*.

The average electric water heater has an efficiency of about 88 per cent which is very good.

A case on record shows where a family of three people cooked three meals per day at a cost of from $3.55 to $4.85 per month for current, the current costing five cents per kilowatt hour. This would average 889 watts per person per meal. Another case where a record was kept the average was 631 watts.

An electric toaster can be used every morning to make toast for a family of five for less than twenty-five cents a month, the current costing seven cents per kilowatt hour. Coffee for five people can be made twice a day for the same sum.

Electric milk warmers for babies have become indispensable to those that have used them. The electric heating pad has replaced the old fashion hot water bottle and is always ready for immediate use. The temperature can be regulated to a nicety, and, if desired, the heat can be turned off without removing the pad.

The modern apartment house is now providing, in the kitchen of each apartment, an outlet for the connection of an electric range, and a number of them are equipping these apartments with electric ranges, using this as an inducement to prospective tenants.

Another field for both heating and cooking devices is the bungalow and summer cottage. This type of home rarely ever has any means of heating, with the possible exception of an open fireplace in the living room. There are frequently times when heat is needed in other portions of the house, and the luminous electric heaters will be found a great convenience. These heaters, being light in weight and portable, can be carried from one room to another and plugged in a receptacle provided in each room. Their cheerful glow and the entire absence of any odor, and the fact that they do not vitiate the air as gas does, should make them extremely popular. If for any reason the luminous radiator is not desired the tubular air heater can be used the same as a steam radiator which it somewhat resembles in appearance.

Electrically equipped restaurants have become quite popular in England, and there are a number in the United States which have been in

Electrically Equipped Kitchen, Stanley Hotel

satisfactory operation for a number of years. This is demonstrated convincingly in the case of a large hotel in the East. The equipment consists of large baking and roasting ovens, broilers, stock kettles, grids, stew pans, steam table, plate warmer, hot plates, cereal cookers, etc. Between 1,300 and 1,800 people are served daily. During one week 7,000 people were served, 3,759 ordering a full meal. The current consumed was about 290 watts per person per meal. At a rate of five cents per kilowatt hour, this amounted to 1.5 cents per person per meal.

The Stanley Hotel, Estes Park, Colorado, does all of its work by electricity—cooking, heating, lighting, laundry, etc. The manager, Mr. Lamborn, is very enthusiastic and states that "the advantages of electric cooking, irrespective of its cost, are impossible to deny," and he thinks that the use of electricity in the kitchen is bound to supercede coal and gas.

The cooking in the St. Francis Hotel Grill, San Francisco, has been done by electricity for the last five years, and in this time has given entire satisfaction.

A central station in an English seashore town put in practice this summer a plan that makes tenting on the seashore more of a joy than ever. Service wires have been run to the best location for camping to provide for electric cooking and electric light. A flat charge of $2.50 is made for all-summer service at each tent, and for this charge a limited number of lamps may be used as much as desired and all the cooking may be done on electric stoves.

The modern hospitals have for some time seen the many advantages of electricity for heating and cooking, and a number of them do all cooking by this means, while others have electric diet kitchens in the various wards.

Rupert, Idaho, is building a $46,000 school house and the whole building will be heated and lighted by electricity. Fresh air will be blown by electric-driven fans over electric-heating units, and thus the heating and ventilating will be combined. In addition to the heating equipment, the school will have a household-economics room equipped with a large electric range and twelve individual electric stoves. There will also be a large electric water heater for supplying hot water for all purposes in the building, including the baths in the gymnasium.

The cost of providing wiring for the many electric conveniences that can be used in the bungalow, city home, club or hotel is only a small per cent of the cost of the building and the progressive architects are now making provisions for these appliances.

There are a number of homes on the Pacific Coast that are using electricity for heating and cooking, entirely, and the results seem to be satisfactory.

In view of the fact that there is such a healthy growth in the use of electricity for cooking, the majority of the central-station companies are adopting special rates for this class of service. The rate for electric cooking in different parts of the country is as follows:

Atlanta, Ga.	6 to 3	cents	per	kw-hr.
Altoona, Pa.	4.5	"	"	"
Des Moines, Ia.	4.5	"	"	"
Detroit, Mich.	4	"	"	"
Duluth, Minn.	3	"	"	"
Kansas City, Mo.	4.5	"	"	"
Los Angeles, Cal.	5	"	"	"
Memphis, Tenn.	3	"	"	"
Omaha, Neb.	6	"	"	"
Portland, Ore.	4	"	"	"
Redding, Cal.	3 to 1.5	"	"	"
San Francisco, Cal.	3 to 5	"	"	"
Seattle, Wn.	3	"	"	"
Spokane, Wn.	5	"	"	"
Springfield, Mass.	6	"	"	"
Superior, Wis.	5	"	"	"

* * *

Always a Way to Get More Business

Dull months are a "habit" and a "state of mind" more than anything else. They don't belong in the scheme of modern business economics.

There's always a way to get more business. There's always a way to stimulate sales. There's always a way to bring the buyers to your store or the orders to your desk. If you'll tell the public what you've got, tell it to them in the right way, and keep at it, you can turn the dullest month in the year into a record-breaker.

Western States Slow to Authorize Buildings for Panama-Pacific Exposition

IN response to inquiries from our readers, letters have been addressed to the Governors of all the Western States for information concerning plans that are being made by each State for their respective buildings at the Panama-Pacific Exposition. The fair management has given out that practically all the Western States would have special representation; in other words, had appropriated money and engaged an architect to prepare plans for a building. But these advance press notices do not seem to be founded upon facts, at least the Governors' letters do not bear out the statements of the public press. Out of a dozen letters received, only two Governors give any definite information of actual preparation of plans for State buildings. Possibly though some of the Legislatures that have not yet taken any action will come in line when they assemble this fall. The letters follow:

Santa Fe, New Mexico,
September 19, 1913.

The Architect and Engineer,
F. W. Jones, Managing Editor,
San Francisco, California.

Dear Sir: A letter from you to His Excellency, the Governor of New Mexico, has been forwarded to the chairman of the Board of Managers for this State at San Diego for the Panama-California Exposition. At a recent meeting of the board the plans of the firm of Rapp & Rapp of this city and Trinidad, Colorado, were adopted with the unanimous approval of the board. If you desire, a print of the plan will be sent you as there is being made a number of prints for the purpose of advertising said plans throughout the State and elsewhere.

Yours truly,
R. E. TWITCHELL,

Editor's Note—The above letter would seem to refer to the San Diego Exposition and not the San Francisco fair.

THE STATE OF WYOMING
Executive Department
Joseph M. Carey, Governor — Cheyenne

September 2, 1913.

The Architect and Engineer,
617-619 Monadnock Building,
San Francisco, Cal.

Gentlemen: In reply to your letter of August 27th, I will state that Wyoming has no appropriation for a building at the Panama-Pacific International Exposition.

Very truly yours,
KATHERINE TEAGUE,
Secretary.

THE GOVERNOR'S OFFICE
State House, Phoenix

September 2, 1913.

Dear Sir: In reply to your letter of the 27th ult., I have to inform you that the State of Arizona has not, as yet, any appropriation to provide for an exhibit at the Panama-Pacific Exposition. It follows, of course, that no architect has been engaged to prepare plans for a building to house an exhibit.

At this time, an initiative petition is being circulated, with a view to having the people of this State provide an appropriation of money for Arizona's participation in the Exposition. The matter, however, cannot be submitted to the voters before the fall of 1914, so that there is no immediate prospect of any architect being engaged.

Yours very truly,
GEO. M. P. HENCH,
Governor of Arizona.

EXECUTIVE OFFICE
Helena, Montana

September 2, 1913.

Dear Sir: In the absence of Governor Stewart, I have the honor to acknowledge receipt at this office of your letter of the twenty-seventh of August, making inquiry concerning the plans for a Montana building at the Panama-Pacific Exposition.

The last session of the Montana Legislative Assembly made no appropriation for this State's representation at the Exposition. The Governor has appointed a Commission to secure funds for an exhibit by this State, but it does not now seem probable that a Montana building will be erected.

Yours respectfully,
WILL AIKEN,
Secretary to the Governor.

STATE OF NEVADA
Executive Chamber, Carson City

August 29, 1913.

Editor The Architect and Engineer,
San Francisco, California.

Dear Sir: In the absence of Governor Oddie, I beg to acknowledge receipt of your favor of the 27th instant relative to the plans for the Nevada State Building at the Panama-Pacific Exposition, and in reply will state the Board of Directors for the Exposition have not as yet made any arrangements for the Nevada building, but this will be attended to when the Directors meet to consider matters relative to the Exposition.

The appropriation for the Nevada exhibits will not be available until after the December collection of taxes.

Very truly yours,
AUSTIN JACKSON,
Secretary to the Governor.

STATE OF OREGON
Executive Department, Salem

August 30, 1913.

The Architect and Engineer,
617 Monadnock Building,
San Francisco, Cal.

Gentlemen: This is to acknowledge receipt of yours of recent date, in reference to Oregon's building at the Fair, and to say that these matters are in the hands of the Oregon Commission recently chosen to have charge of the State's interests at the Panama Fair. Mr. O. M. Clark of Portland, Chairman of the Committee, will undoubtedly advise you as to the situation.

Very truly yours,
OSWALD WEST.

STATE OF WASHINGTON
Office of Governor, Olympia

September 3, 1913.

My Dear Sir: The Governor has received your letter of August 27th, and has requested me to advise you that he has referred the letter to Mr. Richard Seelye Jones, Secretary, Washington State Exposition Commission, 1522 Terry Avenue, Seattle, who will be glad to give you the information requested. Very truly yours,

IRWIN W. ZIEGAUS,
Secretary to the Governor.

STATE OF IDAHO
Office of
EXECUTIVE COMMISSIONER
To the
PANAMA-PACIFIC INTERNATIONAL EXPOSITION
SAN FRANCISCO, 1915.
Fred R. Reed, Executive Commissioner, Boise.

September 8, 1913.

Architect and Engineer,
San Francisco, Cal.

Dear Sir: Your letter of August 27th to Governor Haines has been referred to my office. Messrs. Wayland & Fennell, of Boise, are the architects for the Idaho State building at the Panama-Pacific Exposition, their address is Idaho Building, Boise, Idaho. Very truly yours,

FRED R. REED,
Commissioner.

STATE OF COLORADO
Executive Office, Denver

September 4, 1913.

The Architect and Engineer,
San Francisco, Cal.

Gentlemen: On behalf of Governor Ammons I acknowledge your letter of August 27th with reference to the plans of Colorado for a building at the Panama-Pacific Exposition. On account of the financial condition of the State it was not possible for the Legislature to make an appropriation for an exhibit at this exposition. Yours sincerely,

C. W. FAIRCHILD,
Secretary.

1527 Terry Av.,
Seattle, Sept. 22, '13.

The Architect and Engineer,
San Francisco, Cal.

Your letter of Aug. 27th to Governor Lister has been forwarded to me for reply.

This Commission has appointed Mr. A. F. Heide, formerly of Seattle, as its architect. Mr. Heide is now in San Francisco and can be addressed in care of the Dept. of Works at the Exposition. As soon as the details regarding the State's building site are settled, Mr. Heide will prepare plans for the proposed building and submit same to the Commission.

If there is any other information you desire, I shall be glad to furnish same. Very truly yours,

RICHARD SEELYE JONES,
Secretary Washington State Exposition Commission.

"Business" and the Manufacturer

By COLONEL GEORGE POPE
President National Association of Manufacturers

WHAT is the justification for the constant attacks of newspapers and individuals upon the integrity of the great employing interests and especially the manufacturers? What is the object of the general destruction of confidence in everybody's sincerity and honesty? What is there in business that calls forth the wholesale denunciation of its most essential factors?

Business, in a broad interpretation of the word, means any activity conducted for profit. Many are prone to consider "business" to mean only manufacturing—an impression that may have been caused by the use of the senseless phrase "big business," the application of which to industry is as inappropriate as is that of the word "statesmen" to all elected to represent their several states at the capital of the nation.

Let me indicate, however, the position of manufacturing in the general scheme of the national development.

Manufacturing is the basis of all production. Even the farmer cannot produce his crops without the aid of the manufacturer, nor can such crops be distributed without the aid of the transporting appliances that have been manufactured.

The merchant can neither sell, deliver, exhibit, advertise nor account for the goods produced and transported without the aid primarily of the manufacturer.

The consumer cannot be housed nor reach a market, expeditiously, cannot even if he could reach a market, utilize the natural raw products without those articles produced by the manufacturer.

Light, heat and power, so indispensable to progress, depend not upon the farmer, the shipper, the merchant, the consumer, but upon the energy and ability of the manufacturer, and the wages paid by him, the means with which to purchase.

Why, then, these continual attacks upon that body of citizens upon whom every man, woman and child is dependent? Why this joy at every assault upon the manufacturer? Why the unaccountable desire of so many legislators to penalize the manufacturer, to tax him out of existence or restrict his freedom of commercial intercourse? There can be but one answer. They are symbolic of the exhilaration of prosperity and a consequent ambition to destroy, typifying the lowest instinct of nature.

I conceive the task of my administration to be to create through our association a realization in the minds of our members and manufacturers generally of their duties as citizens irrespective of any political or social affiliation. We are Americans first, partisans last; and no matter what tariff legislation, or class legislation, may be enacted, we owe to those who are dependent upon the manufacturer a sincere, honest trial of that legislation. Because we are not infallible, it might be—I repeat, that there may be no misunderstanding, it might be—this nation would prosper under the proposed tariff revision. It is also possible that those for whom class legislation was enacted would be the first to feel its oppression; that they who have caused its enactment, would insist upon its repeal in order to preserve their own organization from the attacks of another whose cardinal principles are mob rule and anarchy.

In all the history of this nation there has never been a time when the

necessity for organization and co-operation among manufacturers has been more apparent than today. Assailed by the unthinking, oppressed by the legislator, organizations such as ours with its great constructive policies have been made the football of politics and the target of the mud-slinging newspaper.

If the great productive forces of the country are to be unimpaired, if manufacturers are to realize their importance as a class in the nation's welfare, and if they are to protect themselves effectively from the assaults from all sides upon their business existence and thus preserve the general prosperity, they must stand together in purpose and deeds.

* * *

Constructing a Concrete Swimming Pool

BUILDERS are occasionally confronted with somewhat puzzling problems, these not infrequently occurring in connection with the building of a swimming pool, which, as is well known, quite often leaks to such an extent that it has to be re-lined and made smaller. Interest is therefore likely to attach to some particulars dealing with a carefully designed and constructed pool recently completed in the new gymnasium of the Rensselaer Polytechnic Institute at Troy, New York. The pool, it may be stated, is 75 feet long and 30 feet wide, with a depth of 8 feet at one end and 4 feet at the other. It is tiled on the bottom and sides with three-quarter-inch square white ceramic tile laid in cement. The pool is in the basement of the gymnasium in a room 97 feet long by 40 feet wide and 18 feet 6 inches high. The floor around the pool is of terrazzo and the side walls are covered with white tile 3 by 6 inches in size. According to the Engineering News, the pool was constructed as follows:

"A bed of clean ashes, 12 inches thick, was placed on the clay foundation. On this was placed a layer of concrete 4 inches thick. Above this came a waterproofing course consisting of a heavy liquid asphalt into which, while hot, a layer of tarred felt, weighing 15 pounds per 100 square feet, was imbedded. This was followed by alternating layers of felt and asphalt until five layers of felt and six moppings of asphalt were applied. All the felt was bedded into the asphalt while the latter was hot, and each layer of felt was completely covered by asphalt. A bed of concrete, 12 inches thick, reinforced with galvanized wire cloth, was laid on the felt. The wire was No. 3 of 3 by 3-inch mesh and the sheets of wire were turned over and locked to each other over the entire bed of the pool. Near the sides of this 12 inch bed of concrete twisted steel bars 10 feet long of one-half-inch square cross-section, spaced 12 inch c. to c., were imbedded. Seven feet of the length of these bars was imbedded in the 12-inch course and the bars were turned up so that 3 feet of their length was in concrete side walls, which were carried up from the 12-inch bed. This was done all around the pool and at the four corners these bars were curved in basket form. The bars hold the bed and side walls together and materially help to form a tight pool. The top of this bed and the side walls were then covered with heavy liquid asphalt and five layers of felt and moppings of asphalt were applied as described above for the waterproofing beneath. An additional layer of felt and asphalt was applied at all angles of the pool.

"The sides of the pool were then lined with a brick wall 8 inches thick and the bottom was covered with a layer of concrete 4 inches thick which closely fitted against the wall. All interstices between the brick wall and the waterproofing behind it were filled with grout. This is important.

No interstices should be left to exert pressure behind the lining of the pool when the water is drawn off. A pool constructed in New York some years ago had the slabs of marble lining it thrown out by the water pressure behind them when the water was let out of the pool. Water in interstices behind the lining cannot escape as quickly as the water in the pool and pressure behind the lining under considerable head may result.

"The bottom and sides of the pool are lined with three-quarter-inch square white ceramic tile laid in cement mortar.

"The scum gutter extends all the way around the pool. It carries off any scum and also any excess of water in the pool. It is drained by twelve 3-inch pipes at equal intervals around the pool. The ends of these pipes are covered with strainers in the bottom of the gutter. There is also a 4-inch overflow pipe at one end of the pool, with a strainer placed about one-half inch above the bottom of the gutter. Cleanouts are provided for all these overflows.

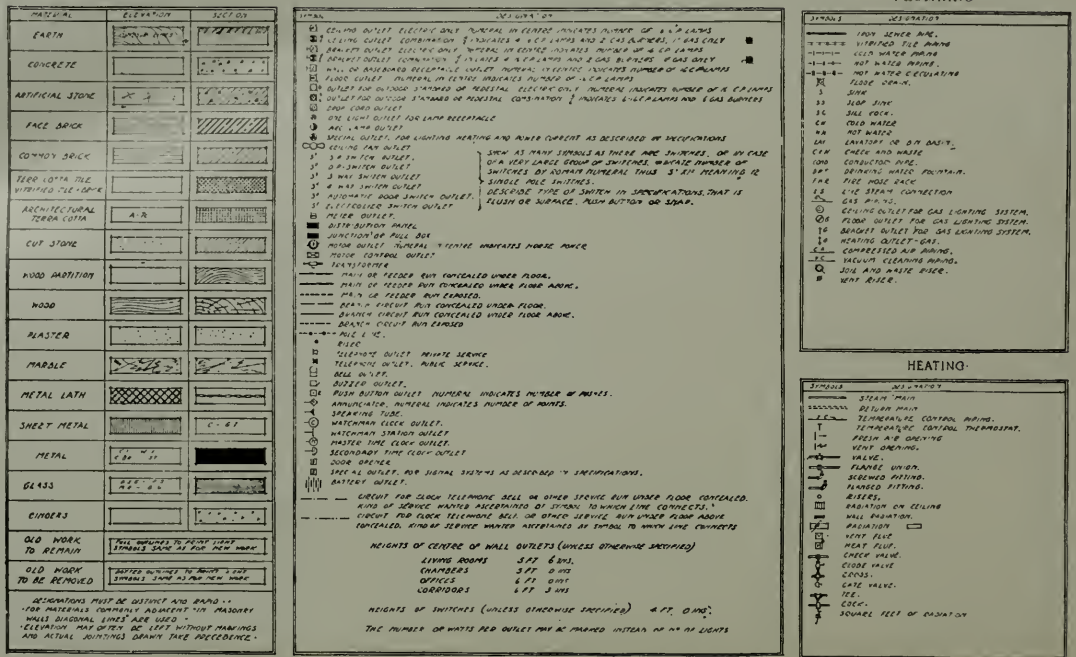
"Provision is made for draining any water which may percolate through the upper layer of waterproofing under the bottom of the pool by means of a 4-inch pipe which leads to a waterproofed manhole outside the pool in the machinery room. A float is provided to indicate the presence of water in this manhole. Such water may then be pumped out. The object is to prevent upward water pressure under the bottom when the pool is empty.

"The water is filtered by mechanical filters before it enters the pool. It passes from a heater, where the temperature is automatically kept constant, to the filters and thence to the pool. Two-inch brass pipes carry it from the heater to two points of discharge; one on each side of the pool near the shallow end. A 12-inch cast-iron circulating pipe extends from the deep end of the pool near the bottom to the machinery room. This acts as a sump for a pump which forces the water through the heater and filters back to the pool.

"Any water on the terrazzo floor surrounding the pool is drained away from the scum gutters to strainers connected with pipes which carry it to the scum-gutter drainage system independently of the scum gutters. This keeps any dirty water on the floor from being swept into the pool.

"Eight shower baths and a steam room are placed at one end of the room containing the pool."

State Armory, Sacramento, California


ARCHITECTURAL
MATERIAL
ELEVATION
SECTION
EARTH
CONCRETE
ARTIFICIAL STONE
FACE BRICK
COMMON BRICK
TERRA COTTA TILE VITRIFIED TILE-DRY
ARCHITECTURAL TERRA COTTA
CUT STONE
WOOD PARTITION
WOOD
PLASTER
MARBLE
METAL LATH
SHEET METAL
METAL
GLASS
CINDERS
OLD WORK TO REMAIN
OLD WORK TO BE REMOVED
DESIGNATIONS MUST BE DISTINCT AND BRIEF.
FOR MATERIALS COMMONLY ADJACENT IN MASONRY WALLS DIAGONAL LINES ARE USED.
ELEVATION MAY OFTEN BE LEFT WITHOUT MARKINGS AND ACTUAL JOINTINGS DRAWN TAKE PRECEDENCE.
ELECTRICAL
SYMBOL
DESIGNATION
CEILING OUTLET ELECTRIC ONLY. NUMERAL IN CENTER INDICATES NUMBER OF 16 CP LAMPS
CEILING OUTLET COMBINATION. NUMERALS 4 16 CP LAMPS AND 2 GAS BURNERS, IT GAS ONLY
BRACKET OUTLET ELECTRIC ONLY. NUMERAL IN CENTER INDICATES NUMBER OF 16 CP LAMPS
BRACKET OUTLET COMBINATION. NUMERALS 4 16 CP LAMPS AND 2 GAS BURNERS. IF GAS ONLY
WALL OR BASEBOARD RECEPTACLE OUTLET. NUMERAL IN CENTER INDICATES NUMBER OF RECEPTACLES
FLOOR OUTLET. NUMERAL IN CENTER INDICATES NUMBER OF 16 CP LAMPS
OUTLET FOR OUTDOOR STANDARD OR PEDESTAL ELECTRIC ONLY. NUMERAL INDICATES NUMBER OF 16 CP LAMPS
OUTLET FOR OUTDOOR STANDARD OR PEDESTAL COMBINATION. NUMERALS 6 16 CP LAMPS AND 6 GAS BURNERS
DROP CORD OUTLET
ONE LIGHT OUTLET FOR LAMP RECEPTACLE
ARC LAMP OUTLET
SPECIAL OUTLET, FOR LIGHTING HEATING AND MOTOR CURRENT AS DESCRIBED IN SPECIFICATIONS
CEILING FAN OUTLET
3 WAY SWITCH OUTLET.
DP SWITCH OUTLET
3 WAY SWITCH OUTLET
4 WAY SWITCH OUTLET
AUTOMATIC DOOR SWITCH OUTLET.
ELECTROLIER SWITCH OUTLET
METER OUTLET
PUSH BUTTON PANEL
JUNCTION OR PULL BOX
MOTOR OUTLET. NUMERAL IN CENTER INDICATES HORSE POWER
MOTOR CONTROL OUTLET
REFRIGERATOR
SHOW AS MANY SYMBOLS AS THOSE ARE SWITCHES, OR IN CASE OF A VERY LARGE GROUP OF SWITCHES, INDICATE NUMBER OF SWITCHES BY ROMAN NUMERAL THUS 3 MEANING 12 SINGLE POLE SWITCHES.
DESCRIBE TYPE OF SWITCH IN SPECIFICATIONS, THAT IS FLUSH OR SURFACE. PUSH BUTTON OR SNAP.
MAIN OR FEEDER RUN CONCEALED UNDER FLOOR.
MAIN OR FEEDER RUN CONCEALED UNDER FLOOR ABOVE.
MAIN OR FEEDER RUN EXPOSED.
BRANCH CIRCUIT RUN CONCEALED UNDER FLOOR.
BRANCH CIRCUIT RUN CONCEALED UNDER FLOOR ABOVE.
BRANCH CIRCUIT RUN EXPOSED
RISE & VC.
RISER
TELEPHONE OUTLET PRIVATE SERVICE
TELEPHONE OUTLET. PUBLIC SERVICE.
BELL OUTLET.
BUZZER OUTLET.
PUSH BUTTON OUTLET. NUMERAL INDICATES NUMBER OF PUSHES.
ANNUNCIATOR. NUMERAL INDICATES NUMBER OF POINTS.
SPEAKING TUBE.
WATCHMAN CLOCK OUTLET.
WATCHMAN STATION OUTLET
MASTER TIME CLOCK OUTLET.
SECONDARY TIME CLOCK OUTLET
DOOR OPENER
SPECIAL OUTLET, FOR SIGNAL SYSTEMS AS DESCRIBED IN SPECIFICATIONS.
BATTERY OUTLET.
CIRCUIT FOR CLOCK TELEPHONE BELL OR OTHER SERVICE RUN UNDER FLOOR CONCEALED. KIND OF SERVICE WANTED ASCERTAINED BY SYMBOL TO WHICH LINE CONNECTS.
CIRCUIT FOR CLOCK TELEPHONE BELL OR OTHER SERVICE RUN UNDER FLOOR ABOVE CONCEALED. KIND OF SERVICE WANTED ASCERTAINED BY SYMBOL TO WHICH LINE CONNECTS
HEIGHTS OF CENTRE OF WALL OUTLETS (UNLESS OTHERWISE SPECIFIED)
LIVING ROOMS 8 FT 6 INS.
CHAMBERS 8 FT 0 INS
OFFICES 6 FT 0 INS
CORRIDORS 6 FT 3 INS
HEIGHTS OF SWITCHES (UNLESS OTHERWISE SPECIFIED) 4 FT. 0 INS.
THE NUMBER OF WATTS PER OUTLET MAY BE MARKED INSTEAD OF NO OF LIGHTS
PLUMBING
SYMBOL
DESIGNATION
IRON SEWER PIPE.
VITRIFIED TILE PIPING
COLD WATER PIPING
HOT WATER PIPING.
HOT WATER CIRCULATING
FLOOR DRAIN.
SINK
SLOP SINK
SAL VOIX.
CW COLD WATER
HW HOT WATER
LAV LAVATORY OR BATH BASIN.
CWH CHECK AND WASTE
CONDUCTOR PIPE.
DWF DRINKING WATER FOUNTAIN.
FHR FIRE HOSE RACK
LS LIVE STEAM CONNECTION
GAS PIPING.
CEILING OUTLET FOR GAS LIGHTING SYSTEM.
FLOOR OUTLET FOR GAS LIGHTING SYSTEM.
BRACKET OUTLET FOR GAS LIGHTING SYSTEM.
HEATING OUTLET - GAS.
COMPRESSED AIR PIPING.
VACUUM CLEANING PIPING.
SOIL AND WASTE PIPES.
VENT RISER.
HEATING
SYMBOLS
DESIGNATION
STEAM MAIN
RETURN MAIN
TEMPERATURE CONTROL PIPING.
TEMPERATURE CONTROL THERMOSTAT.
FRESH AIR DUCTING
VENT DUCTING.
VALVES.
FLANGE UNION.
SCREWED FITTING.
FLANGED FITTING.
RISERS.
RADIATION ON CEILING
WALL RADIATION.
RADIATION
VENT FLUE
HEAT FLUE.
CHECK VALVE.
GLOBE VALVE
CROSS.
GATE VALVE.
TEE.
ELBOW.
SQUARE FEET OF RADIATION

Architectural, Electrical and Plumbing Symbols Compiled by Mr. W. W. La Chance

The Selection of Architects

THE problem of selecting an architect for a proposed schoolhouse is one of the perplexing duties of a school board in which the private business experience of the members is not of much avail, says the School Board Journal. Even the man who has had considerable building done for himself will find that he is at a loss in proceeding to a choice.

A public project like a schoolhouse brings out elements of competition between architects that the private individual or corporation can brush aside with ease. The idea of equality before the law makes every architect, no matter how unfitted he may be, consider himself eligible to act for a board of education. The fact that the designing of schoolhouses involves many fine technical considerations which can only be met by an architect who has had considerable experience in this class of work and who is acquainted with the pedagogical, hygienic and administrative requirements of a school building, does not enter the mind of the average applicant because he is absolutely ignorant of these problems and of their bearing upon his selection.

The American idea of fair play and the desire of school boards to obtain the best possible plans for a proposed building are the causes for the gradual introduction of the competitive system of selecting plans for public buildings. For a variety of reasons, the competitive system has not worked well and the most progressive boards of education are turning to some other means for finding efficient architects. These means, they believe, should involve the idea of fitness for a given piece of work based upon past performances rather than upon a well drawn set of sketches, or a beautifully colored perspective.

A contribution toward better methods in selecting architects has been made by the school board at Parkersburg, W. Va., where the old "competition" was ruled out in the selection of plans for a high school. Under the leadership of Superintendent H. B. Work, the board issued an invitation to architects to submit themselves for the project in hand according to the terms of an "invitation." This invitation, which is printed below, embodies all of the advantages sought in the "competition" plan, and adds the factor of personal fitness which the latter usually overlooked. The invitation is self-explanatory:

The Invitation

1. The city of Parkersburg has voted $300,000 in bonds for improvements in its public schools.

2. It is intended to expend about $225,000 of this amount for a high school building.

3. The board of education desires to secure the services of a competent architect, and this notice is sent to you for the purpose of inviting you to appear before the board on July 10, 1913, if you desire to be considered in connection with the architectural work of this building.

4. The board has, in a preliminary way, decided on the kind of building that will meet the requirements.

5. Preliminary sketches for the proposed building are not desired at this time. The board expects to select the architect who is best qualified to do the work.

6. If you appear before the board on the above date, the board would ask you to be prepared to answer the following questions:

7. How long have you been engaged in your profession as an architect?

8. What has been your training and experience? Included in this question the board desires information as to what buildings you have designed, including buildings other than school buildings.

9. The board would be pleased to see photographs of some of the more important buildings which you have planned and erected.

10. Give the approximate cost of the various structures which you present as examples of your work. Also state the names of the general contractors for such buildings and state whether or not you had charge of the supervision of the construction.

11. Give an outline of your methods of doing business—how your plans are prepared, how detailed, how many copies of plans you furnish. Submit samples of working plans, details and specifications of at least two jobs.

12. A brief reference to your methods of handling work would be desirable.

13. What are your facilities for handling work of this kind? Have you in your employ competent designers and engineers and building superintendents?

14. Give such other information as you yourself would like to have if you were about to employ an architect for a building of this kind.

15. The above information should be submitted in writing, but the board desires you to appear personally at the above date if you are interested in this work.

16. After the board has decided on the architect to whom it thinks this commission should be given, it will expect him to prepare preliminary sketches of the proposed building and develop such sketches until a satisfactory plan has been evolved. Should the architect appear to the board to be incompetent to prepare plans for the kind of building desired then the board would expect to be at liberty to take the matter up with some other architect, and would be under no obligation to the first party.

17. The architect chosen for the work will be expected to enter into a proper contract with the board. The fee for full professional services will be —— per cent. Other conditions of the contract will be in accord with the usual practice and must be satisfactory to the board.

18. After you have appeared before the board on the above date and have submitted to it in writing the information requested, the board expects to make a thorough investigation of all applicants beore calling in one of the number to prepare preliminary plans.

19. Please advise promptly if you desire to come before the board. If you wish to appear but cannot come on the date mentioned, please advise what date will be convenient, making it as near the date herein mentioned as possible.

* * *

$500,000 Hotel for the Exposition

Architect Edward T. Foulkes of San Francisco is preparing plans for a 2,000-room hotel to be known as the Inside Inn and which will be the only concession of the kind inside the Panama-Pacific Exposition grounds. The hostelry will be of frame and plaster construction, three stories high and will cost $500,000.

Structurol Steel Dome, Kahn Department Store Building, Oakland, California
Dyer Bros., Fabricotors and Erectors

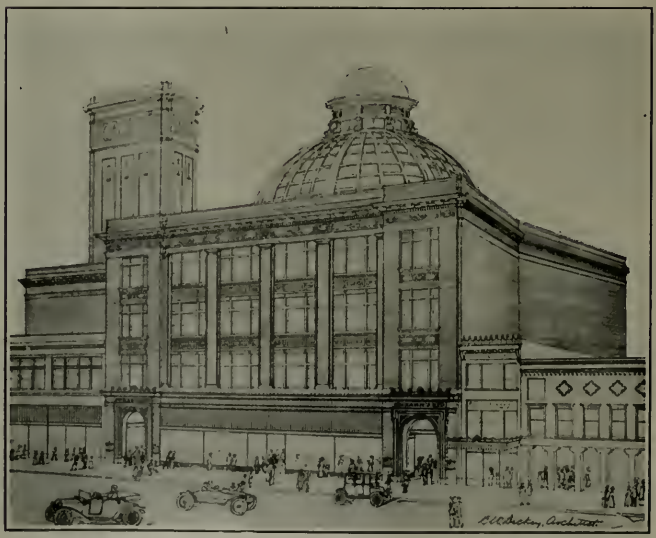
Steel Dome of the Kahn Department Store Building, Oakland*

THE completion of the Kahn department store building in Oakland marks the successful accomplishment of several unusual structural problems, not the least important of which was the fabrication and erection of the structural steel frame that carries the immense structure. The feature of this huge steel cage is the elliptical-shaped dome, 90 by 72 feet and 148 feet above the sidewalk. Despite the fact that the dome was a most difficult job to fabricate, the shop-work was so good that when assembled all holes matched exactly, and the usual reaming was unnecessary. Architect C. W. Dickey was so well pleased that he wrote the Messrs. Dyer Bros. a congratulatory letter.

Another large Oakland contract now being filled by Dyer Bros. is the Oakland auditorium, the steel frame of which will cover a ground area 400 by 180 feet and will contain something over 2,200 tons of steel. The arena is covered by eleven pin-bearing trusses of 175-foot span. The two immense travelers, each weighing about fifty tons and to be used for setting the steel, are now being erected on the building site. Twenty-two of the main columns in this building will weigh nine tons each.

*Editor's Note—The series of articles on "The Steel and Iron Industry of California" will be resumed in the November Architect and Engineer. The story of the Western Iron Works will be told in that issue and in December President Noble will tell in his own way how the Pacific Rolling Mills has grown from a modest, unimportant industry to one of the largest steel shops on the Pacific Coast. The series will be continued through 1914, several pages being devoted each month to some one of the structural and ornamental iron concerns of California.

Steel Frame, Kahn Building, Oakland. C. W. Dickey, Architect
Dyer Bros., Fabricators



Kahn Department Store Building, Oakland. C. W. Dickey, Architect

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Next Convention City—Seattle.

Plans Accepted for Santa Cruz Bridge

Thomas & Post of Los Angeles have had plans accepted by the Santa Cruz City Council for a bridge over the San Lorenzo River on Water street, Santa Cruz. The bridge will be similar in construction and appearance to that of the Union Traction Company, which it will parallel, and which was designed and built by Mr. Thomas when a resident of Santa Cruz. The cost will be between $14,000 and $20,000. The bridge will be of concrete.

Letters to Architectural Clubs

The attention of officers and members of the Architectural Clubs of America is directed to the following communication from the San Francisco Architectural Club. Any clubs which have not received a copy of the letter are especially requested to communicate their address to the San Francisco Architectural Club:

To the Officers and Members of the Architectural Clubs of America.

Gentlemen: At the last regular meeting of our club a committee was appointed to investigate the feasibility of instituting a system of membership transfers between the various Architectural Clubs of America, and it is with this in view that we propose the following:

At the present time the clubs of the Pacific Coast transfer members in good standing. Any member, going from one city which has an Architectural Club to another, may become a member of the club in the latter city without the payment of an initiation fee upon presentation of a clearance card from the secretary of his former club.

At this time draughtsmen are continually leaving our club to study at the large universities and to work in the various offices throughout the country; and there are a great many draugbtsmen now in the cities on the Pacific Coast who, if given a chance to transfer, would in all probability take up their membership in the clubs of these cities.

The benefits to be derived from such a system of membership transfers would be:

(1) A decrease in the resignations of members who are traveling.

(2) An incentive for members on leave of absence from their own clubs to join the club in whatever city they may be working.

(3) Assistance to draughtsmen in securing employment in a strange city.

(4) Membership in Architectural Clubs would become more valuable by reason of this system.

(5) The various Architectural Clubs would be brought into closer relationship, and this might eventually result in a permanent organization of Architectural Clubs.

We would ask that you give this important matter your consideration at the earliest possible moment. Upon your approval of same we will submit our plan for your criticism. Any suggestion you might offer would be greatly appreciated.

SAN FRANCISCO ARCHITECTURAL CLUB.
Address: W. I. Garren, Transfer Committee.

Two Architectural Competitions

The Weber Memorial Committee of the city of Stockton is conducting a competition for plans for a concert pavilion, to be erected in Stockton in memory of Captain C. M. Weber, the founder of the Slough City. The competition is open to all architects in California, and plans must be submitted by November 1st. The program may be obtained from John P. Irish, Jr., secretary of the Chamber of Commerce, Stockton, Cal.

The supervisors of Modoc county, California, are holding a competition for plans for a county court house to be erected at Alturas. The building is to be of steel, stone and brick and is to cost $90,000. The drawings must be submitted by November 6th. The program may be obtained by addressing J. B. Estes, chairman Board of Supervisors, Alturas, Cal.

Southern California Architect's Chapter Meets

First steps in a movement to test the constitutionality of the law of 1872 requiring architectural competitions on public buildings other than State buildings were taken by the Southern California Chapter of the American Institute of Architects at its September meeting, which was the first since the summer vacation. There was a unanimity of opinion regarding the course to be pursued with reference to the law of 1872 and a committee consisting of Messrs. J. E. Allison, H. M. Patterson and Homer W. Glidden was to arrange for a test suit to be brought preferably in the Los Angeles county courts, to secure a ruling on the constitutionality of the law. State Attorney General Webb in a written opinion prepared at the request of the State Superintendent of Schools, has declared that the law of 1872 has been practically nullified by subsequent acts of the legislature regulating the letting of contracts on public buildings. Other attorneys have concurred in this opinion and the members of the chapter are confident the law can be knocked out in the courts. An able attorney will be employed by the chapter to fight the test suit in its behalf.

The chapter endorsed the nomination of Mr. Octavius Morgan for director of the American Institute of Architects to succeed Mr. A. F. Rosenheim, whose term will expire at the close of the present year.

Unanimous approval was also given by the chapter to the nomination of Mr. J. C. Austin, president of the chapter, to a fellowship in the Institute. This is one of the highest honors that can be conferred upon a member of the Institute.

The legislative committee was instructed to confer with Mr. J. J. Backus, chief inspector of buildings, and urge that the present city ordinance regulating the inspection of reinforced concrete work be permitted to stand and assuring him of the co-operation of the chapter in the enforcement of its provisions.

The result of the vote taken during the summer vacation on the question of permitting members to place name signs on buildings under construction was announced by the secretary. Thirty-nine votes were cast in favor of the proposition, 23 against and three ballots were returned blank.

Personal

Architect Charles J. Rousseau announces the removal of his office from the Phelan building to rooms 401 and 402 Maskey building, 46 Kearny street, San Francisco.

Tacoma Architects and "Tentative" Plans

There will be wide interest among architects in the campaign recently started by architects of Tacoma against drafting tentative plans in competition with each other. The Pacific Builder & Engineer of Seattle, says: "The matter came up at a noonday luncheon attended by nearly all of the architects of the city. Several of the leading men of the profession have already come out as opposed to the system which drains the resources of the architect, usually for naught. They were the first to break the ice and they reported that they had made, if not an enemy, at least an 'unfriend' of the builders who wanted competitive plans without cost. Nevertheless, the other architects of the city have backed them up and also refused to take the job on a competitive basis. As the local architects have not adopted a resolution taking official cognizance of the matter, some of the members of the association are strongly urging that such a step be taken to do away with the tentative plan work altogether. This will probably be brought up at a meeting in the near future."

New Architects

The State Board of Architecture for Southern California has granted certificates to practice to the following persons: Paul A. Needham, 616 Wright & Callender building, and George W. Eldredge, 804 Security building, Los Angeles; Ernest J. Kent, Bakersfield; Raymond S. Wiley, 152 Hill street, Ocean Park; Walter F. Douglass and Paul F. Hartman, 608 Timken building; Frank S. Snerr, U. S. Grant Hotel, and Frank E. Mead, 441 Meneece building, all of San Diego. A temporary certificate was granted to Architects Barnett, Haynes & Barnett of St. Louis for the erection of the Brockman office building, at Seventh street and Grand avenue.

New Hotel

Architect G. A. Lansburgh, Gunst Building, San Francisco, has taken bids for the general construction of a six-story and basement Class C hotel on the north side of Sutter street between Jones and Leavenworth streets, San Francisco, for A. Eisenberg, the wholesale jeweler. The building will have steel frame with reinforced brick walls, and front of pressed brick and terra cotta. There will be about 80 rooms, and the estimated cost is $60,000. The building has already been leased to Mrs. Reicht.

New Depot for Los Gatos

According to a statement made by Southern Pacific officials to G. W. Hume, a representative of the Los Gatos Chamber of Commerce, construction work will be begun on a new depot in Los Gatos in the near future, accommodating passengers on both the steam and the electric roads. According to the statements of the officials, the new building will be of the prevailing mission style of architecture, frame, plaster and tile roof.

Architectural Club Banquet

The San Francisco Architectural Club held its twelfth annual banquet on September 27, commemorating the anniversary of the club's organization. The affair was held in a down town cafe, and enjoyed by some sixty enthusiastic members. A varied form of entertainment was provided during the evening after an elaborate menu. Mr. Ernest Hildebrand, the toast master, called upon prominent members, who responded to appropriate toasts relating to the profession and topics of the day. The speakers were President Harry Nye, Louis Cohn, Otto Schrader, August Headman, Tobias Bearwall, Alfred Lowenthal, George Greenwood, A. Jacobs, William Sherman, Harry Thomsen and C. F. Pratt.

After the banquet several large sight seeing autos were provided by the committee, and the entire party proceeded to the Cliff House and beach, where the beauties of a California Indian Summer night were enjoyed and cares of business thrown to the winds.

The Firm of Curlett & Son

Owing to poor health, Mr. William Curlett, who has been a leading figure in the architectural progress of San Francisco for many years, has retired from active service. His son, Alexander, succeeds to the firm of Curlett & Son and will make his residence in Los Angeles, where he will be able to personally supervise a $1,000,000 building under construction there. Work in San Francisco contracted for by the firm of Curlett & Son will be completed under the firm name by C. E. Gottschalk, who has been associated with the senior Curlett for many years. Mr Gottschalk will at the same time take up the practice of architecture under his own name and to this end will establish himself in new offices on the ninth floor of the Phelan building

Amweg to Build Library

F J Amweg of San Francisco has been awarded the contract at $20,000 for the construction of a public library building in East Bakersfield. Trewhitt & Shields of Fresno bid $26,973. It will be a one story and basement brick building, with pressed brick exterior, hardwood floors and finish. Orville L. Clark, Brower Building, Bakersfield, is the architect

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THE CENSORING OF ARCHITECTURE

A Chicago physician who believes in the City Beautiful idea has had his ideals rudely shattered by the construction of an unsightly bridge on Milwaukee avenue in the Windy City, and which he declares is an eyesore to every person with a primitive sense of beauty. After severely taking to task the municipal authorities for permitting the construction of such an ugly structure the doctor—William Held—goes on to say:

It is high time that we follow the example set by other nations, who have gained a reputation for the beauty and symmetry of all their buildings. In Germany, for instance, such a monstrosity as the viaduct mentioned would be impossible. This is on account of the systematic work of a commission, whose duty it is to investigate every plan for any proposed new work before the work is started. The duty of this commission ranges from examining the plans for the erection of a lamp post to those of the most magnificent building. The commissioners are experts in their line; they are earnest and sincere and take pride in their work. Anything that is not compatible with symmetry, beauty and safety, is condemned and alterations in plans suggested and made until all requirements are fulfilled. Not until then can a contractor commence with his work. As a result of this ceaseless labor, which is conscientiously performed, we find, indeed, on passing through the streets of any German or Austrian city that every lamp post is designed with the fundamental idea of serving two purposes, that of beauty as well as utility.

I remember well that in former years, ere I had opportunity to compare conditions from my own observation, I rebelled against the idea of having a commission investigate every plan for a store front before the granting of a permit. I then thought this an unnecessary interference. Now I have learned that this is the only way in which to obtain the wonderful results for which German cities are famous. Let the scope of our building department be extended along that line and place the responsibility for all such work in the hands of a non-political body of men who will take pride in rescuing Chicago from the influence of builders who, had they their own way, would keep on making Chicago look like a frontier town.

A LESSON FOR ARCHITECTS

Recently damage to the extent of $25,000 was wrought within a few minutes by a fire which broke out at noon time in the heart of New York City. The building was known as the Barney Block and was a four-story structure of brick and brown-stone.

The absence of inflammable materials in the hall was said to have saved the entire building from destruction. Damage to the extent of some $25,000 was done to antique furniture and other costly fittings, collected by Mr. Barney, who killed himself after the failure of the Knickerbocker Trust Company. That the loss was not greater was due to the fact that the fittings in the "green room," as the drawing room where the fire started was called, were put in storage the day before.

Two points stand out conspicuously here. The significance of the opening sentence in the above quotation should not be missed by the architect. The marble lining of this hallway is said to be a feature of the Barney home. The other point relates to the absence of private fire extinguishing equipment or, if this existed, to its very evident inefficiency. The fire is said to have been discovered by the butler, who smelled smoke while the family was at lunch. Although there were ten servants in the house, there is no account of any attempt at extinguishment until the arrival of the fire department.

It begins to look as if the architect were destined to solve this problem of furnishing adequate fire equipment for emergency use. Probably not until houses are designed to accommodate portable or other suitable apparatus will their installation be accomplished.

Back Numbers Wanted

The Architect and Engineer will pay 25 cents a copy for six or more copies of the February and July (1913) numbers of The Architect and Engineer. Address, 617 Monadnock Building, San Francisco.

A Railroad Yarn

E. O. McCormick, vice-president and general manager of the Southern Pacific Railroad, was seated in his office in the Flood building one day recently when the door was suddenly and abruptly pushed open and an Irishman, hat on head and pipe in mouth, walked in.

Mr. McCormick looked up in astonishment.

"I want a pass to Fresno," said the visitor.

"Who are you?" came the indignant reply.

"Mickey Doyle, sir—Mike Doyle, one of your switchmen."

Mr. McCormick, with a keen sense of the proprieties but at the same time a keener sense of humor, said:

"Now, Mickey, I am not going to say that I will refuse your request, but there are certain polite forms that a man—an employee particularly—should use in asking a favor. First, you should knock at the door of my office and enter only when I say 'come in.' You should take off your hat and remove the pipe from your mouth and say 'Are you Mr. McCormick?' I would reply, Yes, sir; who are you?' Then you should say, 'I am Mike Doyle, one of your switchmen,' and I would probably answer 'What can I can do for you, Mike?' Then you would make your request and I would be glad to do whatever was possible for you. Now you go out and come back in a little while and see if you can't do better than this time."

Mike walked slowly out and carefully closed the door. Mr. McCormick had almost forgotten the incident when about two hours later there came a gentle tap at the door.

"Come in!"

In walked Mike, very demure and respectful, hat and pipe in hand.

"I beg your pardon, sir, but are you Mr. McCormick?"

"I am," said Mr. McCormick. "Who are you?"

"I'm Mike Doyle, sir, Mickey they calls me, one of your switchmen."

"Well, well, Mickey, what can I do for you?"

"You can go to hell, Mac! I've got a pass on the Santa Fe."—Exchange.

Exposition Building

The plans for the New York State building at the Panama-Pacific Exposition in San Francisco have been approved by the State Commissioner at Syracuse, N. Y. They call for a building three stories high, 230x100 feet, stucco construction, ornamental porches and roof. It will cost between $150,000 and $200,000. Norman E. Mack of Buffalo is chairman of the commission.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

The Design of Culverts and Short-Span Highway Bridges

THE construction of good roads necessarily carries with it more carefully designed, better built and more nearly permanent bridges. It is being realized by those in charge of road construction that the bridges are an essential part of the roadway, and need as much, if not more, attention than does the remainder of the highway.

In the past it was only natural that we should have light wooden and steel bridges, with roadways of from fourteen to sixteen feet in width, as the remainder of the roadway—usually dirt, often mud—was of even poorer construction. Little or no attention was given to the aesthetic design, as the culvert or short-span bridge was soon hidden by a growth of weeds. However, as we are developing our highways and are building so-called "hard roads," the appearance of our bridges demands greater attention. In designing these bridges we should keep in mind the possibilities of future development of the community. A culvert or bridge may well serve its purpose and may not appear unsightly if the rest of the roadway is unimproved, but later may become an eye-sore, due to improvements around it. This point is of special importance when we are contemplating the use of concrete or some other form of "permanent" construction. One of the most common mistakes is that of making the bridges too narrow—if it is a question as to which of two widths to use, it is almost always wise to select the greater.

The magnitude of our larger highway bridges naturally draws attention to them, and this generally results in the employment of an engineer for their design (but unfortunately one is not always employed to superintend the construction). It is in our culverts and short-span bridges that the greatest chance for neglect occurs, as their cost is usually low and does not require a special "bond issue."

The U. S. Department of Agriculture, Office of Public Works, has realized that well constructed and durable culverts and short-span bridges are essential to a proper development of our highways, and has issued Bulletin No. 45, which treats of this subject. The information and data are of special value in that they are specific. Typical designs of culverts and short-span concrete and reinforced concrete bridges are shown, and these designs are supplemented with very complete tabular data giving recommended sizes and arrangement of the reinforcement. By the use of these data it is possible for the engineer, with little additional work, to select a structure to fit most conditions where the required span does not exceed thirty feet. It is also of value in helping him to choose the type of structure which will best fit existing conditions.

Horses Not Injured by Concrete Roads

While inspecting a concrete road near Phillipsburg, N. J., Secretary Wilson, Assistant Secretary Ferguson and W. A. McIntyre of the Association of American Portland Cement manufacturers, met a veterinary surgeon who chanced to drive that way. He pulled up voluntarily to get the opinion of the association engineers as to the value of the road, having no knowledge of their identity. An exchange of views developed the fact that the veterinary was a concrete road enthusiast. He is convinced that concrete does not injure horses. On the contrary, he believes they are a positive benefit to them owing to the flat crown and entire confidence with which the horse travels on concrete. The alleged injurious pounding of hoofs and strain upon muscles and tendons is, he said, all a myth. He is convinced that the ordinary macadam road, with its projecting stone, is a far greater menace to the feet of a horse than is concrete, even though macadam may have a little more resiliency. The latter is so slight as to be more than counterbalanced by the even surface of a concrete road. The foot of a horse has its tender parts and a foot-sore animal driven by the veterinary always shows relief and more willingness to travel the moment the concrete road is reached.

Corrugated Iron Piers, Tulare County, Cal.

Unique Bridge Piers of Corrugated Iron

WHEN the Honorable Woodrow Wilson is told that there is no precedent for something which he contemplates doing he proceeds in the most simple and straightforward manner. Instead of hunting around for days and weeks through old records, and perhaps digging out a musty and moth-eaten precedent, he goes right to work and makes a brand new precedent, for himself.

Supervisor Robert Horbach of Tulare county, California, has something of the same method. He has long known that American Ingot Iron culverts were just the ticket when laid horizontally in wet and muddy places, and the mere fact that nobody else was installing them straight up and down didn't worry him in the least when the idea presented itself to use them as bridge piers.

The illustration shows four of the six corrugated piers under the new bridge which crosses the Tule river, near Porterville. They are placed on a concrete base, and are filled with concrete, which is reinforced by vertical and horizontal rods. The corrugated iron of course affords a further reinforcement; and the piers seem likely to prove both strong and permanent. The satisfied looking gentleman, seated on top of the pier, is Mr. Horbach himself.

In the other illustration Mr. Gerald Thomas, the culvert salesman, is taking advantage of the ends of the horizontal reinforcing bars, which project through the pipe, in pulling off a little gymnastic stunt. The remains of the placard still indicate clearly the reason why "this culvert will last."

Los Angeles Needs Storm Sewers

Every heavy rain in Los Angeles is followed by a flooding of the streets that carry off the water from districts without storm sewers. The only way to get across some of the streets dry shod is to wait for an obliging driver and get a lift in his wagon. This condition led one of the councilmen of that city to propose a plan, which was successfully carried out last winter, to utilize the street sprinkling teams and drivers, which were idle during the winter, to haul portable bridges and planks and set them from the curb at the flooded crossing, anchoring them by wire to the nearest telephone post. After the storm they were collected and removed to a storage place until needed again.

Cost and Value of Road Materials

The Deputy State Engineer of Minnesota, John H. Mullen, has made a comparison of the value and cost of roads of various materials suited to the conditions in his State, which shows the following results per mile of road:

Good Earth of Gumbo Roads

Cost of transportation, 20 cents a ton mile.

Average first cost, $700.

Maintenance, $25 per year.

Total cost for 15 years, $1,075.

Suitable for light traffic on branch roads when proper system of maintenance is provided, but will not stand motor vehicle traffic.

Gravel Roads

Cost of transportation, 15 cents per ton mile.

Average first cost including grading, $1,400.

Maintenance, $50 per year.

Total cost for 15 years with two resurfacings at $800 each, $3,000.

Suitable for heavy team and light motor vehicle traffic.

Macadam Roads

Cost of transportation, 12 cents per ton mile.

Average first cost including grading, $4,000.

Maintenance, $50 a year.

Total cost for 15 years with one resurfacing at $1,200, $6,000.

Suitable for same traffic as gravel.

Concrete Roads

Cost of transportation, 5 cents per ton mile.

Average first cost for single track roadway with gravel shoulders, including grading, $7,000.

Maintenance, $20 a year.

Total cost for 15 years, $10,000.

Suitable for all classes of traffic and especially for rapid or heavy motor vehicles and heavy team traffic. Will develop intensive dairy and truck farming and greatly increased traffic.

Where present or future traffic is continuous in both directions the pavement should be double track width, would cost $10,000 per mile and would have practically no maintenance charge in 15 years' wear.

Brick is equally good for such roads but under present conditions in Minnesota is prohibitive in price.

A bituminous wearing surface three-eighths inch thick, applied to the concrete, renders the pavement softer to traffic and removes the glare of the white concrete to some extent. It costs about 10 cents per square yard and must be renewed as it wears out with frequency depending largely on the amount of traffic.

Standardizing Specifications

Not only has there been a demand for certain standard specifications in building material in public and private work, but there is also a widespread demand for a standard form to be followed in the information given on plans, details in the drawings and a general standard form from which estimates can be made. This demand is voiced by Mr. George Nelson, municipal engineer, in a recent issue of Pacific Municipalities. The letter follows:

Dear Sir: In view of the forthcoming convention of the League of California Municipalities, I desire to call attention to the fact that the League has several standing committees, and among others a Committee on Engineering. This committee has, to my knowledge, never done very much but stand, and I therefore suggest that they get busy and commit something.

The problems that nowadays confront the municipal engineer are multiplying in number, variety, size and scope every day, and anything that can be done to ease up and simplify the routine work ought to be welcomed by all.

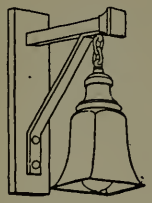
The spreading of the electric railroad system and of the good roads systems has brought the smaller cities into close touch with the larger centers of population, and incidentally also with a larger number of capable and responsible contractors and supply houses, who are willing to bid on any new work coming up and whose competition has materially lowered the prices of public work in many localities. But the coming of the contractors from the big cities has another aspect which must not be overlooked by city officials and especially by engineers.

The contractor from the big city is no philanthropist, and is not going to take any chances of losing his money on the work, so he brings along his attorney to look over and report on the proceedings, the engineer's plans, profiles and specifications. In a good many cases the attorney turns down the proceedings, and somebody is to blame; and as the engineer is the one official with the least political proclivities he often finds himself with a forced vacation on his hands.

It is manifestly in the interest of the engineers connected with the municipal works done under the municipal improvement acts to be as familiar as possible both with the requirements of the acts and with Supreme Court decisions on different points of the acts. Attorneys are apt to raise objections to the work of the engineers for many reasons and sometimes good reasons. The objectionable points may be lack of sufficient data on plans, profiles and cross-sections to properly describe the work, the disparity between the descriptions in resolutions and the plans, plans not in accordance with specifications, and many other minor things to which objections could be raised.

The standing Committee of Engineers should get to work on the standardization of all plans, profiles, cross-sections and specifications for all work done under the improvement acts, laying down rules for the amount of information that should obtain on such plans, size and character of original sheets, scales best adapted for different classes of work, standard form for titles and their location on sheets, standard notation and lettering. In view of the fact that this work is the same all over the State, the standardization suggested would enable the contractors to bid far more intelligently, as the standardized sheets would contain the information necessary for a correct estimate to be made therefrom.

(*Concluded on Page 137*)



Heating and Lighting

Plumbing and Electrical Work

Electricity and the Architect

By C. S. WALTON*

IT may generally be said that the architect in America is always alert and ready to adopt any new and practicable device which will add to the comfort and convenience of the occupants of the buildings designed by him.

In no other country are there so many modern conveniences provided in plans and specifications, and it is due to this fact that the luxury of yesterday has become the necessity of today, and it is true that were it not for the watchfulness of the architect and his ability to see ahead and provide for future developments along certain lines our houses would be out of date in some respect before they were fairly occupied.

In Southern California the small house (on a large lot) has reached its highest development. The so-called bungalow is not a summer cottage for temporary occupancy, but is an artistic little home, substantially built, and designed to satisfy the requirements of people who are used to and must have all the conveniences and comforts. The transition from the bungalow to the palace is gradual and runs through a variety of houses, charming in aspect and perfect in appointment, but the bungalow must be so planned that its occupants may enjoy in a measure the same comforts as those who dwell in more pretentious structures. The reason for this is found in the fact that a large portion of our population is made up of well-to-do people who come here for the climate and for rest. They have had big houses and have struggled with the servant question and the social whirl and now they want peace and quiet, with sunshine and flowers and that freedom from care which the small home provides.

The architect has done wonders in developing this home along practical as well as artistic lines. It is a home for both the well to-do business man, active or retired, and the man on salary. Let us go through one of them and discuss its electrical requirements, having in mind the fact that electricity is now very cheap and may be used freely, if not wasted, without producing an unreasonably large bill at the end of the month.

The wasting of electricity is not well understood. Most people feel that if they turn off the current when they have finished with it all waste is stopped, but they do not know that their lights may be using twice as much current as would be necessary if they were properly placed and the glassware was of a character to give the best results in an economical way. Improperly placed lights and unscientific glassware will every day waste as much current as all other appliances in the house consume. In this one respect the architect can save his client a very considerable sum every month.

Speaking of appliances, and by this is meant all the various electrical devices which perform useful service in the household, they use very little current, and as their use is for a comparatively short time, the cost of running them is small compared with the service they render.

Illuminating engineering is a well developed science. The engineer will take the dimensions of any room, and after learning the use to which it is to be devoted and the general color scheme of ceiling and side walls, will quickly determine the proper location for the lights, their size and the type of reflecting glassware necessary to give exactly the right illumination without wasting the light where it is not needed.

Consumers often complain that they have to use extra large lamps in order to be able to see to read and they blame the lighting company's service. Investigation generally develops the fact that an ordinary lamp, if properly placed, would supply ample light for reading fine print and the consumer is simply

*District Agent Southern California Edison Company.

the victim of an unscientific lighting arrangement.

From the viewpoint of economical use of current for light, and this is an item that must be met every day, dark side walls that absorb light without reflecting it are responsible for doubling the lighting bill. This is an ultra-conservative statement of a scientific fact, and besides the dark walls are depressing and are unsuited to the Southern California home.

Scientific papers frequently contain articles on the effect of strong light on the human eye and it is recognized that in this generation the eye is being subjected to a strain many times greater than it was intended to stand. What the ultimate effect of this unnatural condition will be is easy to predict, but it may be greatly improved by the illuminating engineer who always takes this fact into consideration when preparing a lighting scheme.

From the foregoing it will clearly be seen that much of the comfort and well-being of a household, as well as its economies, are dependent on the architect, and if he is not an illuminating engineer he will do well to consult with one.

* * *

Let us take a look at that bungalow. It is night and we will drive to it. We have some difficulty in locating it because the porch light is not burning and we cannot see the number. As we get out in front of the house the porch light is switched on, but still we cannot see the number because it is in the wrong place and the light does not strike it. House numbers should always he located where the porch light will illuminate them. How many times have you had to lay down an interesting book or interrupt a quiet little game to inform the inquiring stranger at the front door that the number he is looking for is in the next block?

The porch light is one of the most useful lights about the house. It gives the place a cheerful look and is better than a night watchman to keep prowlers away. If all the houses in the block burned their porch lights all night robbers and thugs would select some darker neighborhood for their work. This idea has received the cordial approval of the police department of many cities. To burn a porch light all night costs much less than one would think. Let us figure it:

Take a twenty-five watt lamp, which consumes twenty-five watts an hour, for, say twelve hours, which makes 300 watts a night. For thirty nights it would amount to 9,000 watts, which equal nine kilowatt-hours for a month. Nine kilowatt-hours added to the monthly bill would be a small addition for the results obtained; much less than you would pay for a watchman.

Let us ring the door bell. We hear its sound and know that some one will answer. The architect has located it where it may be heard in every room and it is rung by the lighting current through a little bell transformer; no dry batteries to give out and the cost of the transformer paid many times in saving in repairs to bells and batteries. The amount of current used could hardly be measured and it lasts forever.

We are in the living room which is quite large. How pleasant is the light from the semi-indirect fixture. It is reflected from the ceiling against the side walls and shows the pictures perfectly. There is not a light in the room to glare into the eyes; you can face in any direction without being blinded. On the table is an ornamental lamp connected with a receptacle in the floor, while on the upright piano is a lamp which lights only the music and keys and is connected to a receptacle in the baseboard. A well-shaded standing lamp by a grand piano will be both ornamental and useful. The baseboard receptacle will be needed in the day time for connecting the portable vacuum cleaner which is in such general use.

We pass into the dining room where electricity finds a dainty use in preparing many things for the table. The supply of current comes from the floor and the dining table is wired so that at a convenient point under the edge are several receptacles to which may be attached the coffee percolator, the toaster, the chafing dish, the griddle and the small stove. Ornamental lights for the decoration of the table may also be attached to these receptacles.

If there is objection to bringing the floor plug through the rug the floor receptacle may be located at the edge of the rug and one heavy cord run to the table receptacles. The floor receptacle should then be so located that the cord will run under a chair at the head or foot of the table where it will not be in the way of a person moving around the table.

A receptacle in the baseboard supplies the current for an electric fan, or a luminous heater to take the chill off a cold room on a cold morning, besides being useful for the vacuum cleaner.

In the kitchen the use of electricity becomes greater every day. The electric stove is now perfected and practicable and is economical in the consumption of current. It will do all the cooking, but is not adapted to boiling large quantities of water, which should be done by gas. Many homes have electric ovens and fireless cookers built into the walls, where they take up no room and are a great comfort and convenience.

Over a shelf against the wall is a row of receptacles to which may be connected any or all of the appliances used in the dining room and in addition the electric iron, knife grinder, silver polisher and the ice cream freezer, as well as the fan.

On the back porch is a receptacle for the electric iron, the washing machine and wringer, which are in very general use. The small electrically operated refrigerator, using no ice, is on the way and must be provided for.

Sufficient thought is rarely given to the supply of electricity in bedrooms. A well-planned home should have two baseboard receptacles in each of these rooms, one by the bed for the heating pad, vibrator and milk warmer, and another by the dresser for the curling iron, fan, shaving mug and ozonator, and for the sewing machine motor if there is no sewing room in the house. The vacuum cleaner and possibly the electric iron will be used in every room.

Sleeping porches should also be provided with a receptacle as the heating pad is indispensable in taking off the chill of the bed and driving away dampness.

The bathroom should have one receptacle for the vibrator and luminous heater, the shaving mug and the immersion heater.

Every closet should contain one well-placed light and particular attention should be given to the location of the telephone so that it may have a light near at hand.

The garage should be connected to the house by a three-way switch so that the lights may be turned off or on at either point, and the light should be located at the corner of each building in such a way that no dark places in the yard will afford a hiding place for prowlers. Such an arrangement will be found most useful in going to or from the garage and in illuminating the yard in case of attempted burglary.

Appliances should never be attached to lighting fixtures, as the fixtures will soon get loose and out of order and are not wired heavily enough to carry the necessary current safely. Receptacles in the dining room, kitchen and screen porch should be on circuits of extra heavy wire separate from lighting circuits, in order to carry ample current and possibly to effect a considerable economy in event of specially low rates being made for current used for other purposes than light. It is important that receptacles, except those designed for some specific purpose, be all of the same type and size, as nothing is more annoying than to find that a certain receptacle will not receive some appliances without a change of the plug.

Schoolhouse Ventilation

PRESENT methods of heating and ventilating schoolhouses were objects of sharp criticism during the recent convention of the American Society of Heating and Ventilating Engineers.

Mr. J. W. H. Myrick, a prominent engineer, argued that "the present plenum system of admitting air at the top of the room in most school systems of ventilation is a menace to present and future generations. Macfie and all authorities agree that CO is most abundant at the ceiling, and the black streak between the laths and furring shows the fine dust left as the air has percolated through the crevices. The temperature of the foul air from the body is 98.06 deg. F., which naturally causes it to ascend quickly to the ceiling with its content of three bad elements that should be gotten rid of at once. The introduction at the floor of 10 cubic feet of air per minute for each pupil at 65 deg. F., will properly supply everyone in the room and save two-thirds of the hot air demanded under plenum requirements, without overheating or pasteurizing. Dispense with the fan, stack heater or aspirating coil; eliminate these fixed costs of maintenance and make the room fool-proof, so that an open door or window will not cut off the entrance of both fresh air and heat, which is the

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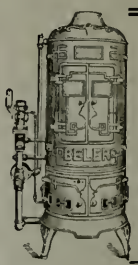

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case now during one-third the school year."

Prof. Bass of the University of Minnesota has proved that 6 cubic feet of air per minute per pupil supplied through the individual duct method is as good as 30 cubic feet. This statement means a financial saving and, I believe, a physiological benefit, for certainly all tests have shown more dust and CO at the ceiling than elsewhere. An individual air supply does not contaminate one's neighbor.

Dr. Gulick draws the line between fresh air and pure air. This statement should be well considered. The question arises whether a stationary or standard temperature and relative humidity is best. This climate is one of extremes, and protection from the elements is necessary. A continuous diet of the same food is unhealthful, and air is as important as food. It may be a question of different constitutions and temperaments; what is food for one may be poison to another.

A national law for ventilation should be passed as soon as the doctors and engineers can agree on some sliding scale, for I question if they ever will get nearer than that. If this is a question of health, as we all agree it is, then it is for the whole country, and is not to be imposed on any business interest, town, city or state as an overhead charge or expense in competition with another section of the country less interested in the welfare of its citizens. I disagree with some as to the sense of smell being a barometer. Statistics show no increase of death rate among the sewer workers of London or the garbage men of our large cities. The disinfectant of our lavatories may change the odor, but I question if one with it is healthier than the other without it.

The death rate in summer months tell us unquestionably the danger point of both heat and humidity.

Let our laws also include the crowded conditions in modern office buildings, where large clerical forces are sometimes found without even a transom over the door."

Given Contract to Move Entire Town

J. N. Blomquist of Scobey, Montana, conferred a few weeks ago with J. J. McDougal, house-moving contractor of Minot, N. D., relative to moving the entire town of Scobey two miles south to meet the Great Northern-Plentywood extension to be completed this fall. Buildings to be moved include banks, hotels, general stores, livery stables, a newspaper and other businesses that go to make up a well regulated town.

The Plentywood extension will come within two miles of the present location of Scobey. There are now seven camps working on the branch and it is expected that trains will be running this fall. In order to be the terminal of the new line the merchants have decided to move.

Safeguarding Heating Pipes

EVEN the comparatively low heat of hot air ducts, steam and hot water pipes is unsafe to trust without special safeguards, says the American Carpenter. It is a generally accepted fact that wood charred very slowly ignites below the temperature required for ordinary charcoal.

A hot-air pipe can get too hot to touch comfortably; it must always be of metal. It is recommended not to place these inside of wood partitions at points nearer than eight feet from the furnace, to allow six inches between bare woodwork and the pipes, and in partitions or closets to enclose each in a tin pipe at least one inch larger than itself or to protect the nearest wood with a tin shield set out from the wood one and one-half and one-half inch from the pipe. Or the pipe can be encased in metal lath, plastered, provided there is seven-eighths of an inch of plaster outside the metal lath. On horizontal pipes, a clearance of three inches between wood and the protecting covering is recommended.

Steam and hot water pipes should be two inches from bare woodwork, or one inch from that with a metal shield, and be centered in a metal tube of one inch larger diameter where passing floors or partitions with a cap at the floor. Indirect radiator boxes or similar casings should be lined. To economize heat, steam and hot water pipes are frequently covered, but it is dangerous to apply a covering which can burn, and some of the trade articles have in the past been found to possess that danger. For economical reasons it is well to select one which is as little subject to disintegration from steam or water leakage as possible.

A register in the floor to heat one

GUNITE *Shot from the* CEMENT GUN

¶ Results that are impossible by hand work become not only possible but perfect by the use of the cement gun. ¶ For finishing and waterproofing concrete surfaces, the paving of slopes in earth embankment, the protection of steel in buildings, the lining of tanks, towers, conduits, canals, etc. etc. ¶ The scope of the CEMENT GUN is almost without limit in its application.

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room from another below is an opening which directly violates the principle of preventing the upward passage of fire, and is therefore objectionable.

At the California State Fair

One of the features of the California State Fair held in Sacramento in September were the industrial exhibits of several well known San Francisco firms handling contractor's equipment.

Parrott & Company made an excellent showing, having on exhibition the well known Smith mixer, also the Chicago mixer and the Smith hand mixer.

The Edward R. Bacon Company of 3840 Natoma street, San Francisco showed a Foote concrete mixer in operation, a road machine manufactured by the Baker Company, Troy dump wagons and traction trains and Sterling wheelbarrows. Mr. Bacon spent part of the week on the fair grounds overseeing the practical demonstrations of his various lines. Mr. Bacon has recently established a Los Angeles branch and it is already proved a most successful venture.

Structural Steel Specifications Heavier

Heavier specifications for structural steel have been reaching mills recently, owing to active demand for material for extensions to New York subway, which has contracts for 100,000 tons of plates and shapes and is inquiring for 3,500 tons more. Of this total the Steel Corporation has 85,000 tons. Maine Central Railroad is asking for 2,000 tons of bridge material and Baltimore & Ohio for 600 tons. Wire prices are going down to a new level, plain wire now being quoted $1.45, Pittsburgh.

U. S. Steel Employees Loyal

The employees of the U. S. Steel Corporation, appreciating that wages have been steadily increased by the corporation, and being apprehensive of what might happen in the event of dissolution, are circulating a petition asking the government to drop its suit. It is said that more than 150,000 names have already been secured. This may furnish the government with the needed excuse to discontinue an action for which there never was any popular demand so far as we have been able to make out.

More Suits Against Cowell Company

Suits to enjoin the Cowell Portland Cement Company from operating its plant at Cowell in such manner as to permit dust to escape therefrom and settle over the adjoining lands and for the recovery of damages totaling $135,000 were filed in the Superior Court recently by the R. N. Burgess Company and the Concord and Bay Point Land Company, which is dominated by the Burgess interests.

In the suit instituted by the parent Burgess Company, damages are sought as follows, for the destroying of crops and injury to land in the Olsen tract, $25,000; Gehringer tract, $20,000 and Matheson tract, $15,000, totaling $60,000. The Concord and Bay Point Land Company seeks damages to the Ayers tract subdivision in the sum of $75,000.

McLeran for Supervisor

Supervisor Ralph McLeran is a candidate for re-election, and if his record stands for anything he will go back into the board by a good majority. McLeran has served the city of San Francisco satisfactorily and he is entitled to another term in the City Hall. His knowledge as a contractor and builder is a valuable asset in holding down the position of supervisor, as has been repeatedly shown in connection with his work on the municipal schools and fire houses. He has given these matters his personal attention and the city has benefited by his advice and judgment.

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By the Way

Some Industrial Information Worth the While

Study the Advertising Pages

The average reader does not pay very close attention to the advertising pages unless he happens to be particularly interested in some product or is in the market for equipment or material. He is missing a part of scientific literature which offers suggestions as practical as the reading pages. He is also losing an opportunity of studying a subject which bears the most important relationship to every business on earth. No matter what line of work you may be engaged in, a knowledge of publicity and salesmanship is valuable. Every form of occupation to be made successful depends upon a degree of salesmanship. Study the Advertising Pages. They represent an expenditure of time, thought and money, which makes them well worthy of your attention.—Municipal Engineering.

Removal Notice

Olive & Leary, sheet metal workers, announce that Mr. Cox has retired from their firm and that they have removed to new and larger shops at 345 Eighth street, San Francisco, where with improved machinery they will be in better shape than before for estimating on and executing orders for all kinds of architectural sheet metal, including cornices, skylights, etc.

Three Suggestions for Good Concrete Pavements

According to James O. Heyworth, engineer and contractor, Harrison building, Chicago, the most important features to be considered in concrete highway construction are:

1: Do not use a top mortar finish, unless it is applied simultaneously with the foundation concrete.

2: Construct the pavement as monolithic as possible, avoiding blocking it off into small units. I consider a small unit less than 100 square yards and suggest that 100 square yards be considered a minimum. Would recommend making the units 1,000 to 3,000 square yards or more.

3: Do not make pavement too narrow and thereby force vehicles to travel

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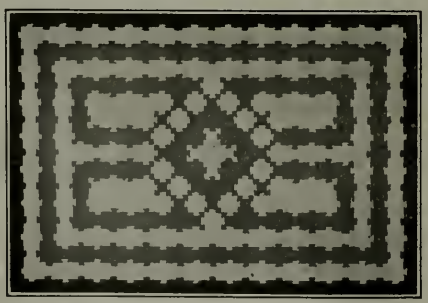

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over the same part of the pavement, forming ruts, but provide a good liberal margin to act as a shoulder and thus prevent breaking off the sides of the pavement.

Coal Chutes

Solicitous care for every detail that goes to complete the modern building is shown in the various refinements of even the most matter of fact utilities. We may take, for example, a coal chute made by the Majestic Furnace & Foundry Company, Huntington, Ind., and illustrated in a pamphlet that has been recently issued, and which may be had on application.

This device is a long step toward improvement over the old method of "shunting" coal through a cellar window with the usual result of soiling the surrounding woodwork and marring the exterior surface of the building.

These chutes are made in a number of styles and are intended to be built into the foundations of the building. The makers claim that they are not only stormproof but burglarproof as well, and that they improve the general aspect of the buildings in which they are located.

Architects Move

Messrs. Shea & Lofquist, architects of several prominent San Francisco buildings, have moved from the Bank of Italy building to the fourth floor of the Bankers Investment building, San Francisco

CLASS A HOSPITAL.—Architects Garrett & Parrell, 405 Currier Building, Los Angeles, have completed plans and specifications for the reinforced concrete hospital building to be erected on Hope street near Jefferson for the Methodist Hospital Association. A group of three buildings has been planned but it has been decided to erect only the central or administration building at present. This structure will be five stories and basement, 139x72 feet, and will contain the offices, operating rooms, dining room, kitchen, private rooms for patients and wards. Reinforced concrete frame, walls and floors, Kahn system of construction, hollow tiles.

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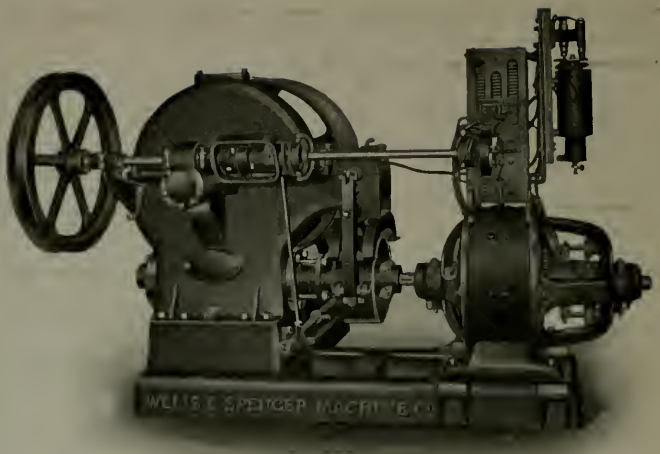

This plate shows a Direct-Electric Freight Elevator Machine, the type being installed exclusively by the Spencer Elevatar Company. The brake is cast in bloc with the gear casing, thereby making it rigid in every respect.

Will Seek Passenger Elevator Business

SAN FRANCISCO is growing not only in population but in manufacturies. This is as it should be, for it is the manufacturing industries that really constitute the backbone of a great city.

For years the firm of Wells & Spencer, frequently called the Wells & Spencer Machine Company, has been carrying on a modest elevator business in San Francisco's manufacturing district. Heretofore the company has not attempted to compete with the larger elevator concerns except in seeking the freight business which has had a steady growth until today the company is recognized as one of the leaders in freight elevator work. Encouraged by its success, Mr. Spencer is determined to enter the passenger elevator field as well. From now on the firm will be known as the Spencer Elevator Company and will figure elevator installations, large and small, freight and passenger, hydraulic and electric. Mr. Spencer says that no job will be too large for him. He says he has machinery and equipment sufficient to tackle the most exacting installation.

Mr. Spencer has secured the services of Mr. George Warnholz, an electrical expert in controlling mechanism for elevators, of recognized ability. As superintendent he will have general oversight of the manufacturing end and he will also personally oversee all installations. It is the intention to specialize in full automatic push button passenger elevators for hotels and apartment houses.

In the matter of freight elevators the company has recently completed installations as follows: All steel construction freight lifts of four thousand pounds each and one hundred feet per minute capacity in the Charles L. Tilden warehouses at Second and Townsend and Second and King streets, San Francisco; a 10,000-pound lifting capacity automobile car in the Speedwell Garage on Van Ness avenue, owned and built by the Northern Construction Company; two 4,000 pound freight elevators in the fire-story concrete warehouse for the Thomson-Diggs Company of Sacramento.

The company has under construction now a very large installation for the Honolulu Iron Works. The equipment will include three heavy direct electric freight elevators and one full automatic dumb waiter. They have submitted a low bid for an 8,000-pound freight elevator to be equipped with Fairbanks scales in a new fireproof building for the Sacramento Warehouse Company, C. C. Cuff, architect.

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The Value of a Good Metal Roof

(Contributed)

THE matter of securing the proper roofing material is always a vital one. It must be conceded that metallic roof coverings possess more advantages than any other class of materials, and when a uniform standard of quality can be assured, they offer practically unlimited possibilities. Every architect and engineer has had more or less practical experience with tin roofing and sheet metal products, and in a professional way is constantly being called upon to decide the relative value of the various materials used for such purposes. For this reason positive information relative to their respective worth is of great importance.

It is a regrettable fact that through the action of certain manufacturers and dealers, roofing products of inferior quality have been supplied the trade and widely used. This class of material has also been grossly misrepresented, to the detriment of the better grades, and to the further detriment of reputable manufacturers who endeavor to manufacture only high-grade products, and whose aim is to raise still higher the standard of metal roofing materials. Particular interest is therefore attached to the research work along these lines conducted by the American Sheet & Tin Plate Company of Pittsburgh, Pa., since the results of their investigations give the architect and engineer more definite information as to the merits of metal roofing products, than they have heretofore been able to secure.

This company has, in the past, discredited the sulphuric acid test as a measure of corrosion; and likewise all hasty or theoretical corrosion tests, believing they possessed but little value to those who desired the real facts with reference to the durability of metal roofings in actual service. In order to further prove the correctness of their position, this firm erected a number of test roofs in the various sections of the country, and covered them with uncoated metal sheets of the various products in common use. These roofs were carefully and scientifically constructed, and natural corrosion was permitted to proceed without interference.

The results of these tests were unequivocal, and likewise surprising, since all of the materials were under identical conditions. In every instance it was found that steel alloyed with a certain percentage of copper withstood the ravages of time and service much better than any other iron or steel material, including the so-called "pure iron" product.

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As a further result of these and other investigations, this firm has adopted Copper Bearing Open Hearth Steel exclusively for roofing tin. In addition to a base of Copper Bearing Open Hearth Steel, particular attention has been given the matter of the terne coating, and other features which are necessary in the manufacture of high-grade roofing plates.

There has been a tendency among architects to attach too much importance to mere names in specifying roofing tin. Such terms as "Old Method," "Old Style," etc., do not always insure the user the quality he may expect—especially where no indication is given of the amount of coating such plates actually carry. Some years ago the above named company adopted the plan of stamping each plate with the amount of coating carried. This materially assists the building superintendent, and all concerned, in seeing that the roofing specifications are being strictly complied with.

Copper Bearing Roofing Tin is now stamped "C. B. Open Hearth" in addition to the brand. More durable roofing tin can now be secured by bearing this in mind, and demanding plates made of this material. These Copper Bearing Plates are sold at no advance in price over ordinary steel roofing plates.

Copper Bearing Steel can also be secured in both black and galvanized sheets as adapted to general sheet metal work, at a slight advance in cost.

The American Sheet & Tin Plate Company is represented on the Pacific Coast by the United States Steel Products Company, with offices at San Francisco, Los Angeles, Portland and Seattle. Architects and engineers who desire to

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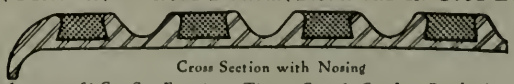

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be fully informed on this interesting subject should address the nearest office for full particulars, and a copy of the booklet entitled "Copper in Steel—the Influence on Corrosion," which contains the results of these various tests, with tables, illustrations and analyses.

The Hill-Canton Sanitary Clothes Dryer

The majority of persons who buy clothes dryers have not the time to personally inspect the various styles and kinds in use, but wish to know the relative merits of the drying cabinets from which a selection is to be made.

Since the Hill-Canton Dryers, made by The Hill-Canton Dryer Company of Canton, Ohio, have been on the market, fortunately for those desiring something satisfactory, it is not compulsory to buy the old style, poorly ventilated cabinet of the past.

Carlyle compared mankind to a flock of sheep. "Stretch a rope across a country path," he said, "about a foot and a half from the ground: then drive a flock of sheep over it! When the

A Combination Bed for Chamber and Sleeping Porch

Here is what the architect and owner has been waiting for a long time and now that their hopes are realized one more step may be said to have been taken towards making the home absolutely complete both from the utilitarian and decorative standpoints.

Is it not a great convenience to have a bed that can be used either on the porch or in the room, as desired?

The ordinary bed on a porch is in the way during the day and is subjected to the dust, soot and dampness.

The Oscillating Portal Wall Bed, manufactured by the Marshall & Stearns Co., Inc., Phelan building, San Francisco, can be put entirely out of the way, permitting the free use of the porch and avoiding the dust, soot and dampness. In case of heavy rain during the night, the occupants can instantly turn the bed into the bed room.

When the bed is down it occupies 7 feet 4 inches from the plaster in the room to the extreme end of the bed.

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bell-wether (or leader) has jumped that rope, lower it to the ground and note what happens. Every sheep in the flock that follows will jump a foot and a half in the air over the same rope though it now lies slack on the earth. They follow the bell-wether blindly--unreasonably--without regard to changed conditions."

air over the same rope though it now lies slack on the earth. They follow the bell-wether blindly—unreasonably—without regard to changed conditions."

Carlyle's comparison fits those who buy clothes dryers without investigation, simply because some one else has.

The Hill-Canton dryer is not the only clothes dryer on the market, but it is said to be the only satisfactory dryer. If the dryer you contemplate ordering is for an apartment house, hospital or institution, a little saving in the first cost will not compensate for the dissatisfaction which will later be experienced by those using such inferior dryer. If for use in your residence laundry room, where the best is desired, nothing but a Hill-Canton should be considered.

There is embodied in the Hill-Canton Dryers numerous exclusive constructive features, which superiority may increase the first cost, but considering that a clothes dryer well made will last a life time, and that an inferior dryer on account of repairs soon becomes a constant expense and is never satisfactory, the conclusion should be that the first cost is not the only cost to take into consideration.

The Hill-Canton drying cabinet is constructed of special galvanized iron which can not rust, corrode or stain. The frame work is of heavy angle and channel iron firmly bolted together.

A full knowledge of the special constructive features of the Hill-Canton Dryer as shown and described in catalogue, will emphasize more strongly that mechanical superiority which carries with it pleasure and satisfaction to the purchaser and credit to the manufacturers.

No part of a drying cabinet is deserving of more careful investigation than the construction of the radiators which form part of laundry stove and extend in cabinet. In other dryers the radiators are made of sheet steel or stove pipe material. Being exposed to heat and dampness they will rust out and burn through, necessitating the increased expense of taking dryer apart to replace radiators—which increased expense does not make cabinet any better in this respect than originally.

Repairs are costly and the best clothes dryer will prove to be the cheapest and most satisfactory.

Radiators in the Hill-Canton Dryers

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An Important Court Decision

The United States District Court of Grand Rapids, Michigan, recently rendered an important decision dismissing the bill of complaint of the American Gas Light Company against the General Gas Light Company of Kalamazoo, Michigan. It was claimed that the General Gas Light Company was infringing upon certain patents owned by the American Company. At about the time the suit was filed letters were sent out warning people against buying or using the General Gas Light Company's lamps because of the alleged infringement. The decision of the court dismissing the bill and ordering costs assessed against the American Company seems to be a victory for the General Gas Light Company, the court having criticised the American Gas Company quite severely for bringing the suit.

W. P. Fuller & Co. Now Making Their Own Varnishes

The following circular letter has been sent out by W. P. Fuller & Co., the well known manufacturers and distributors of high-grade paints and varnishes:

"Owing to the fact that we are now offering to the trade a complete line of house varnishes of our own manufacture, under the name of FULLER VARNISHES, we are issuing a complete new varnish section for our General Catalogue "F." We are mailing this section to you today together with a new varnish index sheet and a gummed insert to be pasted on page 19, covering description of Concreta.

"We ask that you kindly have these sheets inserted in your copy of our catalogue at once, and thus avoid any possibility of their becoming lost.

"We feel that these new pages greatly enhance the value of our catalogue, and trust you may be benefited by them."

Unloading part of a 5,000 yard (equal to 200 car loads) order of washed gravel with clam shell bucket at Bolinas Bay for the J. G. White Engineering Corporation

This photograph shows two of the Pratt Building Material Company's barges (C. F. Pratt, president) unloading washed gravel at Bolinas Bay for the J. G. White Engineering Corporation, who are building two wireless stations for the Marconi Wireless Telegraph Company, one at Bolinas Bay and the other at Marshalls on Tomales Bay. Each of these stations will cost $250,000 and consist of an operators' building, 50 by 80 feet, two six-room bungalows, a three-story modern hotel to accommodate fifty people, power house, six steel towers, each 350 feet high, etc., all made of reinforced concrete.

The Pratt Building Material Company's washed gravel (finest sand to rock 1½ inches) was used exclusively for this half million dollar job.

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A Complete Handbook on Steel Sash

The United Steel Sash Handbook has been received from the publishers. It is the most complete publication of its kind that has ever been issued. Not only complete technical information and details are presented, but the publication is handsomely illustrated throughout with numerous views of actual installations, showing the finished building as well as photographic details.

The complete line of United Steel Sash is fully shown, including all types of sash for every condition of daylighting and ventilation. The Standard Pivoted United Steel Sash occupies one section of the books. In another part is shown the Continuous United Steel Sash, of two types, center pivoted and top hung. Under Vertical Sliding United Steel Sash are included four types of sash: counterbalanced, spring counterbalanced, the lead counter-weighted, and the castiron counter-weighted. There are sections showing the Horizontal Sliding United Steel Sash, the Special Economy Casements, the Vertical Pivoted United Steel Sash, Standard Casements and Special Pivoted Sash. The United Steel Partitions and Steel Doors are also illustrated.

About fifty full-sized sections which are used in building up the United Steel Sash and eight styles of mullions are illustrated. Standard hardware, tables of sizes of Standard Sash, numerous details of installations, and over thirty pages of installations are presented.

The publication has been prepared with great care, and should prove a valuable addition to the library of anyone interested in Steel Sash construction. It is furnished free of charge to practicing architects, engineers and builders.

Provide Runways for Gophers

Gophers are costing the county a lot of money, and officials are figuring on some method of getting rid of them. The gophers dig under the county roads and the weight of traffic on top causes the roadbed to sink, and it is costly work making repairs. The matter of putting out poison for them is now being discussed. A suggestion has been made that drain pipes, if run under the paving at intervals, might relieve the situation, as it seems that the gophers dig the holes beneath the paving so that they can get across the road without going over the surface. A good roads publication recently said that the plan of putting drain pipes beneath the surface at intervals had largely abated the trouble in places where it had been tried, and this may be given a test on some of the new roads now being built in the county.—El Paso (Tex.) Herald.

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Standardizing Specifications

Continued from Page 118

It is obvious that anyone following standard methods in his work would be less apt to make mistakes that would be fatal and jeopardize the signing of the contract.

Of errors that have occurred for which proceedings have been turned down I shall name a few that were attributable to the engineers: In one town the profiles showed other elevations at grade points than the published grade ordinance contained; at another the descriptions in the resolution of intention did not cover the work intended to be done and shown on plans; in one town the resolution of intention called for one kind of work and the plans showed another kind to be wanted; at another the dimensions on the plans disagreed with the dimensions named in the specifications. Equally disastrous are uncertainties in the specifications, their susceptibility to different interpretations, and many other small errors that do not look large but are serious enough when the contractor who has bid the job in too low wants to get out of signing up the contract.

The specifications themselves are subject to just as much standardization as is the rest of the work, and the claim that climatic conditions would make a difference cannot be maintained in the face of an analysis of the items of the specifications.

Take, for instance, the specifications for cement curbs, the first section on plans, work and grading foundation would be the same at all times and everywhere; the sections on shape and construction could be made general and all dimensions and proportions shown on the cross-sections. The section on materials is practically the same all over and mixing and placing could be made to conform.

The general requirements in all specifications ought to be standardized and brought into accord with the street laws and decisions. An analysis of specifications for other work will show that they are all adapted to standardization and that all the minor details could be shown on the cross-sections which should be made up for each street and should show every detail in the work and, together with the plans and profiles, form the pictorial description of the work, in such a way as to admit of no difference of opinion as to what was wanted.

Respectfully,

George Nelson,
Municipal Engineer.

The Merits of Hercules Waterproof Cement

It is not often an architect enthuses over the good results obtained by the use of a certain building material to the extent of giving his opinion of the product in writing. Exceptions happen, however, as evidenced in the case of the Hercules Waterproofing Cement Company of Buffalo, N. Y., whose product has been used exclusively in waterproofing a number of buildings in Los Angeles by Mr. A. S. Falconer, supervising architect for the Standard Building Investment Company of that city. Mr. Falconer states he has given the Hercules material a severe test in connection with seven other products and he finds Hercules the most satisfactory.

The Hercules Waterproof Cement Company is represented in California by the Waterhouse & Price Company. A recent circular issued contains the following information about Hercules:

Hercules compounds for waterproofing become an integral part of the concrete; are everlasting; increase the tensile and compression strength of the concrete; give perfect bond in construction joints; fill all voids in aggregates; prevents hair cracks; produce an absolute impermeable concrete; most reasonable and simple method for waterproofing and strengthening concrete.

Hercules compounds are manufactured in powder, paste and liquid forms, thus allowing the engineer, architect and contractor to use that form with which he may be most familiar; or that form which is best adaped to the purpose.

Hercules Waterproofing and Strengthening Compound is a very fine white powder, and when mixed with a high-grade portland cement, produces absolute impermeability together with an increase of tensile and compression strength. Is used in the aggregate of concrete walls and floors. Is useu in plaster for coating and waterproofing old work. Is packed in paper-lined sacks of 40 pounds each. (Directions.)—Hercules Powdered compound is to be thoroughly mixed with the dry portland cement before the addition of any other materials, in the ratio of 2 pounds Hercules compound to every bag of cement (8 pounds to the barrel). Such cement waterproofed is then used in the regular way for making concrete.

Hercules Waterproofing, liquid form, is a thin colorless fluid, to be applied to the surface of concrete, plaster, brick, etc., already in place. Especially adapted for cement floors, keeping them dry, and prevents dusting. Shipped in 5 and 10 gallon cans and 50 gallon barrels. (Directions.)—Hercules Liquid Waterproofing is to be thoroughly stirred, and of a moderately warm temperature before using. The surfaces to be waterproofed are to be dry and clean. Apply the liquid with a soft brush, and coat slowly. Two coats are recommended, the second about six hours after the first. Use about 1 gallon to every 125 square feet one coat.

Hercules Waterproofing, paste form, is a creamy odorless substance to be dissolved in the water with which the concrete is mixed. It is packed in five, ten and fifteen gallon kegs and barrels, and weighs approximately eight pounds to the gallon. (Directions.)—Dissolve the paste in the guage water, in the ratio of 1 gallon paste to 16 gallons water. Begin the dissolving of the paste by mixing it with an equal part of water, and when thoroughly mixed and thinned, add the remaining proportion of water.

Hercules Waterproofing compound is being incorporated with high-grade portland cements at eastern mills, and we quote on such cement waterproofed, either f. o. b. mills, or to the point of delivery upon request.

Sutter Hotel Exterior

In a brief article in the September number of The Architect and Engineer the statement was made that the beautiful face brick of the Hotel Sutter was supplied by the Sacramento Sandstone Brick Company. This was correct, except that the article failed to state that it was the Hotel Sutter in Sacramento. The Hotel Sutter in San Francisco also has a very handsome exterior face brick which was furnished by N. Clark & Son, the well known brick and terra cotta manufacturers, with head offices in San Francisco and factory in Alameda.

The Plastergon Wall Board

Wall board is of special interest to the builder and the carpenter-contractor by reason of the fact that it not only opens up to them a new source of profit but at the same time enables them to produce a more satisfactory job for their customers, thereby meriting that best of all advertising—the reputation of turning out better work than a competitor. An interesting feature in connection with wall board is that it is sanitary, can be removed and replaced without injury for the insulation of pipes or wiring or for the repairing of plumbing or electric fixtures. It does not crack, disintegrate or crumble and can be used in any place where lath and plaster may be utilized with results which cannot be obtained with the latter materials. The merits claimed for the wall

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The Dahlstrom Architectural Portfolio

Just issued by the Dahlstrom Metallic Door Company primarily for the purpose of furnishing Architects and Builders specific information for the use of hollow metal doors, interior trim and other work in modern fireproof buildings, is now ready for distribution.

The Portfolio contains twenty full page plates 13 inches by 17 inches, showing designs and detailed construction together with photographic illustrations of some of the most notable installations of the Dahlstrom Products in a number of prominent buildings, and shows the manner in which many of the leading architects design this class of work.

The Architectural Portfolio will prove useful to Architects, Architectural Draftsmen, Students and others, as it contains the necessary information regarding the most practical methods of construction, preparation for and installation in buildings of hollow metal doors and trim.

The Portfolio may be termed a perpetual one, as provisions have been made for the insertion of additional plates which will be issued from time to time to show new or novel features as they may develop.

To make this Portfolio available to everyone in any way interested in the subject it is placed on the market at a price of Five Dollars ($5.00) per copy.

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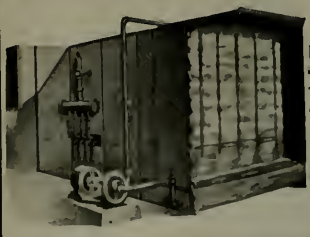

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board placed on the market under the name of "Plastergon" by the Plastergon Wall Board Company, Dept. A, North Tonawanda, N. Y., are worthy of more than passing notice. The material is made by a special process by which the fiber from which the board is produced is treated chemically in such a way as to render it moisture-proof and thereby enable the company to guarantee every panel.

A New Window Device

The Ashlock Steel Folding Burglar Proof Window and Door Guard, which have offices in Cincinnati, Kansas City, Birmingham, Ala., and Washington, D. C., have established a plant on the Pacific Coast with offices in Monadnock building, San Francisco.

This guard is a steel collapsible guard of compact construction, easily set up within a window or door frame. It occupies but little space when not in use and can be quickly and easily extended across the opening within the frame. Attached to the inside of the window it absolutely does not interfere with the raising or lowering of the windows nor with shades or draperies, and can not be noticed when not extended. It effects an absolutely impassible barrier through doors and windows to burglars and thieves. It is convenient, easily adjusted and a sure protection.

The Bakersfield Court House Competition

Fourteen sets of plans were submitted to the Kern county supervisors for the proposed $150,000 jail building at Bakersfield. Following is a list of those competing: T. B. Wiseman, Bakersfield; I. W. Dolliver, San Francisco; O. L. Clark, Bakersfield; G. W. Eldridge, Los Angeles; L. B. Valk, Los Angeles; Barnett, Haynes & Barnett, Los Angeles; Chesbro & Van Eaton, Salt Lake; Kysor & Biggar, Los Angeles; Watson Vernon, Aberdeen, Washington; E. J. Kump, Bakersfield; King & Taylor, Los Angeles; White & Company, Spokane, Wash.; Train & Williams, Los Angeles; Walter Parker & Company, San Francisco. The board took the plans under advisement.

Paul De Martini, Architect

The death occurred on September 7th of Paul De Martini, who had been associated with H. D. Mitchell in the practice of architecture at 628 Montgomery street, San Francisco, for the past three years. The late Mr. Martini planned a number of city flat and store buildings. He was a native of Genoa, Italy, forty-three years of age. His death was caused by tuberculosis brought on by pneumonia. He is survived by his wife, Rosa De Martini and by three sons.

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Merited Praise for Bluxome & Co.

The beautiful entrance gateway to the classic St. Francis Wood property at the head of the Sloat boulevard in San Francisco was built by the firm of Bluxome & Company, general contractors of reinforced concrete buildings with offices in the Monadnock building, San Francisco. The same company built the Spring Valley pumping station on the Sloat boulevard, below Nineteenth Ave.

The following letters received from the Mason McDuffie Co. and the Spring Valley Water Co. upon completion of above mentioned structures speak for themselves:

Sept. 18, 1913.

My Dear Mr. Bluxome: I am sending you herewith a photograph looking across the pool in the south oval towards the loggia and oval on the north side of our main entrance. In doing so I wish to express to you my appreciation of the service rendered us by you and your organization in constructing the main gateway to St. Francis Wood, of which this photograph shows a portion.

I feel that it was your desire to give us the best piece of work that you could do, irrespective of profit to yourselves, and the result has been a very satisfactory one to us. The work was not only well done and honestly done, but it was admirably done and the gateway as it stands should prove of lasting value to you as an advertisement of the character of work you are prepared to perform.

Yours very truly,
(Signed) DUNCAN McDUFFIE,
For Westgate Park Co.

San Francisco, June 7, 1912.

Messrs. Bluxome & Company,
Monadnock Bldg., San Francisco, Cal.

Gentlemen: I am sending you a framed photograph of the Central Pumping Station of the Spring Valley Water Company.

Mr. S. P. Eastman, manager and second vice-president, has asked me to assure you of the appreciation of the company for the painstaking, careful and workmanlike manner in which the construction of this building was carried on. The character and quality of the work speak for themselves in the appearance of the completed structure.

On my own behalf, I take this opportunity of saying that the relations existing between your firm and myself as representative of the company were extremely cordial.

Yours very truly,
(Signed) G. A. ELLIOTT,
Superintendent.

A photograph of the St. Francis Wood gateway is shown elsewhere in this issue of the Architect and Engineer. It is truly a splendid example of finished concrete work.

Important Acquisition to The N. O. Nelson Mfg. Co., St. Louis, Mo.

The recent acquisition of the enameled ironware plant of the Union Sanitary Mfg. Company, Noblesville, Ind., by the N. O. Nelson Mfg. Company, St. Louis, Mo., marks another advance in line with the progressive policy of this firmly established house. The N. O. Nelson Mfg. Company is undoubtedly one of the largest jobbers and manufacturers of plumbing fixtures in the country, and this latest addition now means a still greater expansion of their business. It is their intention to produce the same goods bearing the excellent reputation that had previously characterized the output of the Union Sanitary Mfg. Company. An annual production of $500,000 worth of enameled ware is the conservative estimate of the officials of the Noblesville plant.

In conjunction with the Bessemer Soil Pipe Company at Bessemer, Ala., and the extensive brass foundries at Edwardsville, it is possible to manufacture practically everything handled through their various branches in different cities.

Immediately following the purchase of the enameled iron plant the reorganization of the same was announced. N. O. Nelson, president; A. B. Pierce, vice-president; L. C. Huesmann, vice-president; L. D. Lawnin, secretary, and J. B. Chambers, treasurer, are the new executives. Their energy and business ability are responsible for the tremendous growth of the N. O. Nelson Mfg. Company and for the substantial basis it now occupies.

The enameled iron plant compares favorably in size with other large foundries in the same line and the eigbt branch houses of the N. O. Nelson Mfg. Company together with four others owned by Mr. Huesmann will probably take care of the greater part of the entire output. Provision for enlargement of the plant when necessity demands has thoughtfully been anticipated and arranged.

The manufacturing site occupies nine acres of land and is reached by two railroad spurs, so that the distribution of the finished goods may be accomplished with dispatch. Prompt deliveries, we are advised, are to be the first and foremost consideration at this factory. Within twenty miles of Indianapolis, this industry is closely located to a manufacturing center of ever increasing proportions, consequently their situation is most desirable, affording admirable facilities to serve the eastern, central and western trades. The land is likewise owned by the concern.

The N. O. Nelson Mfg. Company now control their soil pipe plant, brass foundries, plumbers' woodwork mills, enameled iron plant, machine shops, marble works and specialties shops.

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You ordinarily hurriedly pick up a container, look to see if anything is in it — pour out a quart or more from a half-corked five or ten gallon tin can that has an air hole punched in it and repour this mixture into your car. Maybe you notice a black speck or two floating around, but you are in a hurry and it never occurs to you that this is destructive grit.

Then you wonder

Why a Bearing Becomes Loose

or the noise of the car increases, etc. Why not look to your lubricating oil storage for your car that costs so much more than your watch and needs the same careful attention? Isn't this worth your while.

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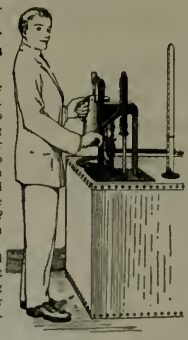

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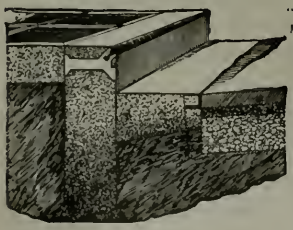

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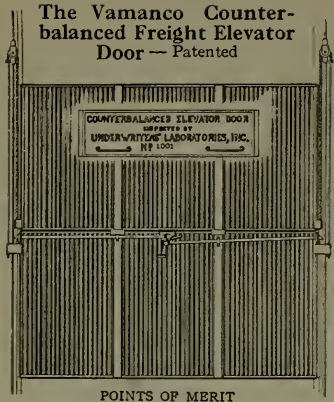

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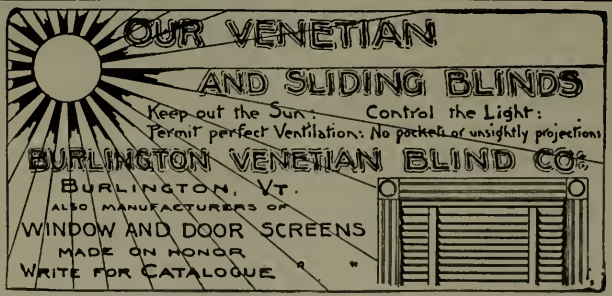

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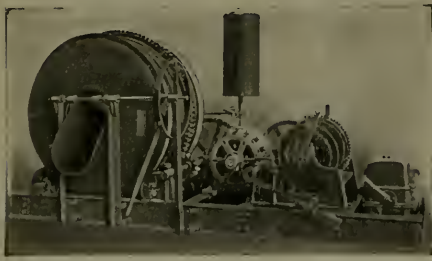

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